A Non-Perturbtive Modification to M-Theory

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INTRODUCTION AND FORWARD.

Preface

This book is the completion of over 30 years of work and study. The Theory, put forth, in here has itself undergone many changes over the years. What isn't known by many is the reason I felt compelled to find a certain solution. In 1965, and again in 1983. I was one of many over the years that witnessed what has come to be referred to as a UFO sighting.

Now, I have always studied science. I have also been for many years an avid fan of science fiction. I grew up in an era that started with the best shows we had were Lost in Space, Time Machine, Land of the Giants, and Voyage to the Bottom of the Sea. Then came the 60's with the advent of Star Trek. This to me was the dawn of a new era for science fiction. But, I always managed to keep my science fact separated from what I considered pure fun. Those sightings challenged me in a way I cannot describe. I will not go into any attempt here to prove they were from another world. Even I at this point in time do not really know. But, it left me with a puzzle that I had to find an answer to. If they were real. Then there had to be a way to get around relativity. That search led me to study everything I could find in the area of physics. I even read some of the most intense books on the subject of gravity, like one called Geometrodynamics. I studied them to the point they became ingrained in my thoughts.

When I studied Physics in college the best we had then was Quantum Mechanics. In the 70's and

early 80's even QED and QCD hadn't been taught that much. But from a background of electronics and Quantum Theory I began to formulate a picture of what was needed. That picture became clearer in the early 90's when I became introduced to QED and QCD. From these I began to formulate a picture of what was needed that parrelled outside development in the area of SUSY and String Theory without my knowing of either. My first version of this theory was almost identical to present M-Theory. Perhaps its because that path is the only one that gives us any real answers. I do not know.

This then is that developed theory with a general background from both Field Theory and String Theory.

BACKGROUND

The dawn of the 20th century was marked by a major change in our understanding of the physical World. Up until then, the old Democritus idea that dated back to 4 BC had held sway. That being that everything in the material world was made up of tiny, indivisible particles called atoms. They were sometimes pictured like tiny billiard balls. To those who studied science and physics at this time the world was able to be described in simple terms of mass differences between the billiard balls.

But change was on the horizon. In 1897, an English physicist working at Cavendish Laboratory in Cambridge by the name of J. J. Thomson had found a way to study bits of atoms that had been broken off. These particles had negative charge and left behind atoms with a positive charge, which we now call ions. Those experiments showed that atoms also had a part of them that carried a negative charge.

Then a man from New Zealand, working at the McGill University in Montreal, by the name of Ernest Rutherford showed that radioactivity transformed an atom of one element into an atom

of another element. He also conducted experiments by using alpha particles to shoot at atoms in crystals or thin metal foil. He found that sometimes those alpha particles would bounce back. In 1911, he came
up with an explanation for this that changed our view of the atomic world. His explanation was that
most of the material of an atom is concentrated in a tiny core, he called the nucleus. Surrounding that is
a cloud of electrons. He determined that alpha particles were actually the nuclei of helium. The
indivisible atom had now become itself a divisible unit.
The simple picture, most of us are taught from the time we are children of an atom being made up
of three basic parts only dates back just over 90 years. What most, who do not work in the field never
realize is how complicated things first got during that near century and some of the work that
followed to make it simpler again. Those complications and the methods found to bring order
back to our understanding of the atom, are what this book is about. This is the story of Quantum Physics
from its early days to the present. As we search onward toward the Holy Grail of Physics. The Theory
of everything.

Special Thanks to the following people.

**Thanks to my old teachers who challenged me to think beyond the text book and to look to
the future. Special thanks to my teacher, friend, and colleage from the Military, George Lovel who
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did find them.
Thanks to friends I've had along the way who gave me a sounding board for some of these ideas
and to those who challenged me back.
Thanks to those who paved the way.
This Project Paper is listed with ICAAP.**

Chapters 1-4

A Non-Perburtive Modification To M-Theory

CHAPTER 1

AN ANSWER TO AETHER THEORY

Basically, most adaptations to this old theory have the following things in common. Space-time does not contain objects, only variations in density gradient. A particle is a Persistent localized undulation of space-time. There is no true physical boundary or distinction Between "within" and "without" the particle. Secondly, all variations on this theory have the Universe formed upon a backdrop of an elastic type substance.

Now, I will not rehash the old experiments that have been conducted to disprove this theory. Indeed, I find it interesting how often this theory resurfaces given those experiments. But, this does not mean that I totally discount all concepts involved with the theory. Indeed, the second issue I mentioned above is inherent even in regular quantum mechanics. And the third is modified in QM in the form of particle-wave duality and the uncertainty principle. It is the first part that I take exception to.

While it is true, that M-Theory and QM both have a particle performing a localized undulation of space-time. There is a difference. In both of these the particle is separate from space-time itself. Both also redefine space-time as not a substance, but a field. This concept of a field was what separated Einstein's work and those who followed from what had come before. I do agree with some authors who have mentioned that the old AETHER was replaced with a different type of AETHER. Indeed, any study of QM alone will show one that the concept of a field has itself become pregnant with its own version of substance. But, in most cases, the central core concept that separated the Field idea from the AETHER has been maintained.

Now, it is true that a field has its own undulation. It is also true that a field's undulation is in most cases of String Theory modified in the string to a distinct undulation. But the difference is that the particle itself is the generator of the field. Not the other way around. One of the central problems that AETHER Theory cannot explain is why the AETHER itself should have one undulation, while in localized areas it would have another. AETHER Theory can explain within its own context how a particle can propagate through space-time. But, it has never been able to explain why the AETHER is different at that localized event. Thus, AETHER theory falls short of its own stated goal of explaining particles. In spite of all the experiments against the AETHER Theory which even I could find arguments around. I feel it is this reason alone that has to by Logic causes that theory to be discarded.

More Against the Aether Theory

Item taken from a book on old Aether Theory.

Speed of Light in A Clear Dense Medium

It is well known that light travels slower in a clear medium such as glass and that light will regain its speed instantaneously when it re-emerges from the glass. The existing wave and particle theories of quantum mechanics cannot explain these observations completely. If light travels slower in glass because it goes through the absorption and emission processes, it should be completely scattered when it enters the glass, and that was not the case. If light really traveled slower in glass, then the problems arise when we try to visualize the processes by which light regains its speed instantaneously as it re-emerges from the glass. Model Mechanics resolves these problems automatically. The processes involved can be visualized as follows: The glass is in constant motions in the E-MATRIX. These motions curved the E-STRINGS within the glass and when light enters the glass, it is being transmitted by the curved E-STRINGS and thus, it appears to travel slower. When light re-emerges from the glass, it is being transmitted by normal E-STRINGS (not curved) and thus, it appears that light regains its speed instantaneously.

The answer to this is simple. First off, it is both QM and modern field theory that has led to this being turned around the other direction and used to speed up light in certain accelerating mediums. Secondly, as has already been established in this theory, since Omega varies according to the density of matter in a local area. Any solid substance, such as a glass, since its matter density is higher should show a slowing of light as it passes through that medium.

Those who subscribe to the Aether Theory usually put forth that the original double slit experiments do not prove QM. The results were simply accountable to movements of the slits. The problem I find with this is that given the size of a photon as compared to the distance between those slits, that movement would have been such that the whole lab had to be shaking. The problem I find with this is that hiding one's head in the sand and blaming everything under the sun for you're problems does not deal with the real life facts. Face up to the truth. The old Aether theory is without substance. What they also tend to forget is that, while a material Aether was done away with. The Space-time SR and GR brought us a newer and richer form
of Aether. Only this one is composed of fields with the substance being what those fields, under certain conditions, form.

CHAPTER 2

Einstein's contribution.

Even though Einstein made his first contributions to the new evolving picture of space and time in the 1920's. I have always found it an historic irony that Hitler in the 40's, even though he sought to developed atomic power, spent the blunt of his energy killing off the same people whom helped America developed atomic energy and the bomb. Indeed, it is even more ironic that the man who formulated the first theory to do away with the old ether forever, started out in life in not only a whole different field. But was reported to have at one time even flunked a science class.

Almost everyone has heard of Relativity. It is such a common term that even some forms of jokes have been built up around it. Like one I once heard in a movie about how a minute with someone you hate can seem like a hour. And, yet, an hour with someone you love can seem like a minute. But few people have ever stopped to see what exactly relativity implies. Few yet, have ever begun to actually look at the implications of His second theory, General Relativity. These two theories that have been tested over and over again have so changed our modern world from that of the old. Never again would space and time have the same meaning.

Now Special Relativity primaryly established that there is no such thing as a special reference frame. It also established that, unlike the old theories built upon the ether, the velocity of light was not only a constant. Any object that had mass would require an infinite amount of energy to be accelerated to the speed of light. It also established that time varied from reference frame to reference frame depending upon the velocity of that frame compared to the other. Thus, time took on a whole new meaning.

But, General Relativity went far beyond that. It remade the very fabric of space and time into something new. Light no longer needed a carrier, or even space, to travel. The endless undulating train of electromagnetic vibrations was now able to bootstrap itself and move along. Space and time became united in a 4 dimensional frame and became no longer absolute. The speed of light became central. But, what he had done was replace the old ponderable medium of the ether with a new sort of ether. He wrote, "Space without ether is unthinkable; for in such a space there would be no propagation of light, and no basis for space-time intervals..." As Wilczek concluded in a letter he once wrote: "There is a myth, repeated in many forms, that Albert Einstein swept the ether into the dustbin of history. " He went on to say, "Einstein first purified, and then enthroned, the ether concept.

Quantum Mechanics

As I mentioned before, physicists once thought the world was composed of little hard objects-atoms and Molecules which interacted and grouped together to produce the variety of materials that one finds around us in the world. They also had a good theory of how light propagated, in a way analogous to ripples on a pond. This was all before the 1900's.
Scarcely had the physicists begun to acknowledge the possibility that they could now proclaim once and for all the solution to the great puzzle was at hand. Their house of cards began to unravel. Further experiments began to show that the behavior of light could sometimes only be explained in terms of particles. Yet, at other times the only valid answer was a wave explanation. Too make matters even worse. Sometimes particles themselves seemed to behave like waves. Then along came Einstein's Theories of Relativity, which changed the way we looked at space itself. By the 1920's no one exactly knew what the truth was any more.

The Origins of QM

James Maxwell was born in Edinburgh in 1831. He later became a physicist who had a strong fascination with the fact that an electric current flowing in a wire produced a magnetic field exactly the same as a magnet itself did. He had also noticed that a magnet moving by a wire produced a flow of electric current in a wire. Moving electricity produces a magnetic field and a moving magnetic field produces an electric current.
Maxwell attempted to write down a set of equations that would link together all of the electric and magnetic phenomena that he and others observed. He came up with four basic equations: one describes the magnetic field that an electric current flowing in a wire produces, a second one described the electric field produced by a moving or changing magnetic field, the third described the electric field produced by the electric charge, and the fourth gave a description of the magnetic field. A close examination of those showed him a flaw. In order to correct that mathematical flaw, he introduced another term into the first equation that gave a description of how a magnetic field could be produced by a changing
electric field without any current flowing. This was based upon observations of a device called a condenser, now called capacitors. His new mathematical termed described what happened between the plates of a capacitor. He so realized that if a changing electric field could produce a magnetic field and a changing magnetic field could produce an electric field that these two parts of a single electromagnetic field could get along without the need of magnets and electricity by themselves.
The changing electromagnetic field his theory predicted was in the form of a wave moving at a certain velocity. That being 186300 miles per second. The very speed of light itself. From this it was easy to deduce that light itself was an EM wave. This, backed up by an earlier British physicists by the name of Thomas Young, who early in the 1800's had shown the wave nature of light through experiments provided an explination of light that has survived even to today.
Then in 1900, Max Planck found by experiment that light had to be measured in terms of discrete packets when he solved the major puzzle of the 1890's about a hot body or black box. He found that EM radiation from a black box can only be explained in terms of the atoms emitting little packets of energy. He found that for every observed black body spectrum there is a characteristic amount of energy equal to the frequency multiplied by a fundamental constant, which we now call h. This energy found by the equation $E=hv$, is the smallest amount of energy of that frequency that can be emitted or absorbed. He also found that it must be an exact multiple of that basic energy. That fundamental constant is now called Planck's constant and equals 6.6^-34.
Planck's original theory met with mixed reception. It explained the black body problem. But too many. It seemed a mathematical slight of hand trick. It took Einstein, almost unknow at that time to turn this trick into something everyone accepted.
Einstein had been studying something that was well known. It is called the photoelectric effect. It occurs when light shines onto a metal surface in a vacuum. The light literally knocks electrons out of the metal. Those electrons can be detected and the energy they carry measured. What he found was that that energy was exactly predicted by Planck's theory. This idea seemed to run counter to the already established concept of light as a pure wave. Some even thought he and Einstein were trying to revive the old Newtonian idea of light corpuscles. By 1918, and 1921 both

had received the Nobel Prize for work in this area and the concept that a particle could be a wave at the same time had become born.
Then in 1924, Louis de Broglie made a suggestion that startled the whole physics community. He suggested that if light waves behave as particles, why could not electrons, which were particles, behave as a wave? He went further and took Planck’s equation and Einstein’s equation and combined them together.

TA APPROACH TO QUANTUM MECHANICS

It has been over half a century since that remarkable period of 1925-27 when modern quantum mechanics suddenly emerged, and quickly replaced Newtonian mechanics and the "old quantum theory" of Planck, Einstein, and Bohr as the standard theory for dealing with all microscopic phenomena. The mathematical formalism of quantum mechanics, though refined and generalized in the intervening decades, has never been seriously challenged either theoretically or experimentally and remains as firmly established today as it was in the 1930's.

And yet over the entire period since the original development of quantum mechanics there

has been controversy surrounding its interpretation. The questions of the meaning of the mathematics and of the underlying reality behind the laws and procedures of quantum mechanics have been a battlefield for five decades, and no truce is yet in sight.

The term contrafactual definiteness as a minimal assumption. It means that for the various alternative possible measurements (perhaps of non-commuting variables) which might have been performed on a quantum system, each would have produced a definite (but unknown and possibly random) observational result and further that this set of results is an appropriate matter for discussion. CFD is actually a rather weak assumption and is often employed by practicing physicists in investigating and discussing quantum systems.

The term locality means that the separated parts of the system described are assumed to remain correlated only so long as they retain the possibility of speed-of-light contact and that when isolated from such contact the separated parts can retain correlations only through "memory" of previous contact. The term nonlocality implies the converse of this, e.g., correlations established faster-than-light across spacelike or negative timelike intervals. One should make the distinction between nonlocal enforcement of correlations, which is at issue here, and nonlocal communication, which (although sometimes confused with the former) is a far stronger condition. This distinction will be clarified later.

The mathematics of quantum mechanics does not deal explicitly with such nonlocal correlations. It does, however, require that any separated measurements of the properties of an extended system be treated as parts of the same quantum mechanical "state", regardless of the degree of separation of the measurements in time and/or space. This common-state requirement could be interpreted as a kind of de facto nonlocality, but that association is not conventionally made in applying the CI to the mathematics.

It has been suggested that on the question of whether there is some fundamental problem with quantum mechanics signalled by tests of Bell's inequality, physicists can be divided into a majority who are "indifferent" and a minority who are "bothered". If there were a prevailing view among this concerned minority as to the resolution of the above dichotomy, CFD vs. locality, it would probably be that CFD, although pragmatically useful in practical applications and discussions of quantum mechanics, must be philosophically abandoned to positivism because the alternative of nonlocality is unacceptable. It is perceived by some that nonlocality must be in direct conflict with special relativity because it could be used, at least at the level of gedanken experiments, for "true" determinations of relativistic simultaneity and must be in conflict with causality because it offers the possibility of backward-in-time signalling. But this view is at best questionable. While it is clear that nonlocal communication between observers could lead to such conflicts, the minimum nonlocal correlations required to invalidate the Bell locality postulate are compatible with both relativity and causality.

The alternative approach to the dichotomy, and that which is advocated in the TA work, is to retain CFD while abandoning locality. Contrary to what might be expected, this does not require any revision of the mathematical formalism of quantum mechanics, but only a revision of the interpretation of the formalism. The transactional interpretation of quantum mechanics (TI), which is the new interpretation presented below, is explicitly nonlocal but is also relativistically invariant and fully causal. In order to do this one must adhere to the following.
Economy (Occam's Razor): It is preferable in constructing the interpretation to use a minimum number of independent postulates.
Compatibility: It is preferable that the non-observable constructs of the interpretation be compatible with physical laws, even when such laws are not directly related to the theory being interpreted, i.e., quantum mechanics. In the present case we will employ the laws of relativistic invariance, macroscopic causality, and time reversal invariance in this context. [The violation of this criterion, i.e, the violation of a physical law by an interpretational construct, is what is sometimes called an "interpretational paradox". These are to be avoided.]
Plausibility: It is preferable that the mechanisms, if any, employed by the interpretation should be physically plausible. Common sense is not always a reliable guide in physics, but it can often help in making a relative choice between otherwise equal alternatives.
Insightfulness: It is preferable that an interpretation provide insight into the underlying mechanisms of nature behind the mathematical formalism. Providing insight into the fundamental processes of nature is an important function of an interpretation. For example, the interpretational concept of field lines introduced by Faraday, while unnecessary to the formalism of electrodynamics, provides a rich and powerful medium for gaining insights into the operation of electromagnetic phenomena.

The problem of nonlocality is closely related to that of the collapse of the SV. The problem in a simple form was first raised by Einstein, at the 5th Solvay Conference. He stated the problem thus "But on one point we should, in my opinion, absolutely hold fast: the real factual situation of system S1 is independent of what is done with system S2, which is spatially separated from the former." Since these words were written the thrust of the nonlocality problem has been sharpened considerably through theoretical and experimental investigations, but the issue remains essentially the same.

For the purposes of the present discussion we will distinguish between two kinds of nonlocality. Nonlocality of the first kind arises from the interpretation of the SV as a physical wave. When the SV collapses the change implicit in the collapse occurs at all positions in space described by the SV at the same time. A physical wave undergoing such a change would seem to require faster-than-light propagation of information. Indeed, even the phrase "at the same time" is only meaningful relativistically in a particular inertial reference frame. Similar nonlocality problems brought about the rejection of Schrödinger's semiclassical interpretation.

CI4 was constructed to avoid difficulties with nonlocalities of the first kind by denying the physical reality of the SV and identifying it instead with "our knowledge of the system". Therefore, when a measurement is made showing that a photon is located at point A (and not at B or C), our knowledge of the photon's location abruptly changes and the magnitude of the SV's value must suddenly drop to zero at B and C, although no spatial propagation, according to CI4, is associated with that abrupt change. CI4 works well in this context. Its effectiveness may, however, reflect the naive statement of the nonlocality problem, which seems to require attribution of physical reality to the SV. But the intrinsic nonlocality of the QM formalism runs deeper than this, as becomes clear when more complicated situations are considered which involve separated measurements of parts of a correlated system. In that situation definitions of the SV become irrelevant because real measurements are involved. This leads to a nonlocality of the second kind, which is associated with the enforcement of correlations in spatially separated measurements.

This kind of nonlocality is demonstrated by the experiments early on performed. Here excited calcium atoms undergo a 0+ to 1- to 0+ atomic cascade and provide a pair of photons, assumed to be emitted back-to-back, which are in a relative L=0 angular momentum state. Because of angular momentum conservation these photons are required to have identical helicities or linear combination of helicities, i.e., they must be in identical states of circular or linear polarization. For this reason the SV of the two photon system permits the photons to be in any polarization state, provided only that both are in the same state. Experimentally this means that if the photons are transmitted through perfect polarizing filters before detection, they must be transmitted with 100% probability if the polarizations of the filters select matching states and 0% if the filters select orthogonal states, no matter what orientation or polarization selectivity the filters have.

We cannot readily modify quantum mechanics so that it becomes local in this way. We can, however, simulate the Furry modification within the FC experiment by placing near the source an additional pair of aligned linear polarizing filters which are rapidly and randomly changed. By this mechanism each pair of photons emerging from the source will be placed in definite and identical but sequentially random states of linear polarization as the photons are transmitted through these filters near the source. The QM prediction for this case can easily be obtained by calculating the predicted rate of two-photon detection for a particular orientation angle (phi) of the randomizing filters and then averaging over all possible values of (phi).

Thus the SV of the photons cannot be described as in a definite but random state. Rather the SV must contain components which describe the photons as being in all possible states of polarization. Only when at least one of the two photons is detected is the SV allowed to collapse into a definite state of polarization, which must be the same for both photons. Until the detection(s) takes place the polarizations of the photons must remain in states which are connected but not specified, in a way which is inconsistent with locality. It is this connectedness which is addressed by the Bell inequality and which cannot be explained away by the "our knowledge" definition of the SV. It is this which we have called nonlocality of the second kind.

Now, if one will follow the structure dictated by this modification to M-Theory. One will find that a more complete picture of particles yields a greater understanding of the process involved in this so that the nonlocality problem is removed.

QCD

Quantum Chromodynamics is the theory of how quarks and gluons interact with themselves and each other. The word quantum stands for the fact that interactions (forces between particles) on this level can be represented as particles that occur only in chunks called quanta. As a consequence, energy can only change by these bits. Gluons are the particles that mediate the force (the strong interaction) in QCD. In the process of constructing the theory, quarks and gluons are quantized allowing the `creation' of individual quarks and gluons.

Both quarks and gluons carry a type of charge called color. Like electric charge, color charge is always conserved. But unlike the electric charge, the color charge (the chromo in always conserved. But unlike the electric charge, the color charge (the chromo in usually called red, green, and blue. The idea is that we know that protons and neutrons (as well as many other particles called hadrons) are made up of quarks. Yet we never see color charge even if we try to break up protons and neutrons into their constituent parts (colored quarks). So the objects that we observe, and therefore construct, must be colorless or color neutral; which is why we cannot see individual quarks. When each quark in a hadron has a different color, red+green+blue=white, the result is a color neutral object. This also allows the quark picture to describe another class of particles (mesons) which have a quark and an anti-quark (color+anti-color=white). Gluons carry color/anti-color pairs that do not have to be the same color. There are 8 gluons as they each have one of the eight possible color/anti-color combinations.

QED

Quantum electrodynamics, or QED, is a quantum theory of the interactions of charged particles with the electromagnetic field. It describes mathematically not only all interactions of light with matter but also those of charged particles with one another. QED is a relativistic theory in that Albert Einstein's theory of special relativity is built into each of its equations. Because the behaviour of atoms and molecules is primarily electromagnetic in nature, all of atomic physics can be considered a test laboratory for the theory. Agreement of such high accuracy makes QED one of the most successful physical theories so far devised.

In 1926 the British physicist P.A.M. Dirac laid the foundations for QED with his discovery of an equation describing the motion and spin of electrons that incorporated both the quantum theory and the theory of special relativity. The QED theory was refined and fully developed in the late 1940s by Richard P. Feynman, Julian S. Schwinger, and Shin'ichiro Tomonaga, independently of one another. QED rests on the idea that charged particles (e.g., electrons and positrons) interact by emitting and absorbing photons, the particles of light that transmit electromagnetic forces. These photons are virtual; that is, they cannot be seen or detected in any way because their existence violates the conservation of energy and momentum. The particle exchange is merely the "force" of the interaction, because the interacting particles change their speed and direction of travel as they release or absorb the energy of a photon. Photons also can be emitted in a free state, in which case they may be observed. The interaction of two charged particles occurs in a series of processes of increasing complexity. In the simplest, only one virtual photon is involved; in a second-order process, there are two; and so forth. The processes correspond to all the possible ways in which the particles can interact by the exchange of virtual photons, and each of them can be represented graphically by means of the diagrams developed by Feynman. Besides furnishing an intuitive picture of the process being considered, this type of diagram prescribes precisely how to calculate the variable involved.

TOWARD A TOE

The Theory of Everything is a term for the ultimate theory of the universe a set of equations capable of describing all phenomena that have been observed, or that will ever be observed. It is the modern incarnation of the reductionism ideal of the ancient Greeks, an approach to the natural world that has been fabulously successful in bettering the lot of mankind and continues in many people's minds to be the central paradigm of physics. A special case of this idea, and also a beautiful instance of it, is the equation of conventional no relativistic quantum mechanics, which describes the everyday world of human beings, air, water, rocks, fire, people, and so forth. The details of this equation are less important than the fact that it can be written down simply and is completely specified by a handful of known quantities: the charge and mass of the electron, the charges and masses of the atomic nuclei, and Planck's constant.

Less immediate things in the universe, such as the planet Jupiter, nuclear fission, the sun, or isotopic abundances of elements in space are not described by this equation, because important elements such as gravity and nuclear interactions are missing. But except for light, which is easily included, and possibly gravity, these missing parts are irrelevant to people-scale phenomena. However, it is obvious glancing through this list that the Theory of Everything is not even remotely a theory of every thing We know this equation is correct because it has been solved accurately for small numbers of particles (isolated atoms and small molecules) and found to agree in minute detail with experiment.

However, it cannot be solved accurately when the number of particles exceeds about 10. No computer existing, or that will ever exist, can break this barrier because it is a catastrophe of dimension. If the amount of computer memory required to represent the quantum wavefuction of one particle is N then the amount required to represent the wavefuction of k particles is Nk. It is possible to perform approximate calculations for larger systems, and it is through such calculations that we have learned why atoms have the size they do, why chemical bonds have the length and strength they do, why solid matter has the elastic properties it does, why some things are transparent while others reflect or absorb light

It is indeed, given the uncertainty principle of QM a tribute to it that we have managed with it and the Standard Model that includes QED and QCD to make such accurate predictions. With a little more experimental input for guidance it is even possible to predict atomic conformations of small molecules, simple chemical reaction rates, structural phase transitions, ferromagnetism, and sometimes-even super conducting transition temperatures. But the schemes for approximating are not first-principles deductions but are rather art keyed to experiment, and thus tend to be the least reliable precisely when reliability is most needed, i.e., when experimental information is scarce, the physical behavior has no precedent, and the key questions have not yet been identified. There are many notorious failures of alleged TOE computation methods, including the phase diagram of liquid.

In light of this fact it strikes a thinking person as odd that the parameters e, Plank's Constant, and m appearing in these equations may be measured accurately in laboratory experiments involving large numbers of particles. The electron charge, for example, may be accurately measured by passing current through an electrochemical cell, plating out metal atoms, and measuring the mass deposited, the separation of the atoms in the crystal being known from x-ray diffraction. Simple electrical measurements performed on super conducting rings determine to high accuracy the quantity the quantum of magnetic flux hc/2e. These things are clearly true, yet they cannot be deduced by direct calculation from the Theory of Everything, for exact results cannot be predicted by approximate calculations.

But the few facts that one can deduce, plus those we can deduce by second and third order, have allowed us to probe deeper and deeper into the structure of space-time. They have also given us hints toward a more correct picture. That more correct picture has come from the most unique area and over one of the most twisted paths any theory has ever taken. That path is the road to String Theory, M-Theory, and finally this modification to M-Theory.

Chapter 3

BASIC TERMS IN STRING THEORY

SUPERSYMMETRY

Supersymmetry is a theoretically attractive possibility for several reasons. Beyond that is the remarkable fact that it is the unique possibility for a non-trivial extension of the known symmetries of space and time (which are described in special relativity by the Poincare group). Mathematically, it can be described in terms of extra dimensions that are rather peculiar. Whereas ordinary space and time dimensions are described by ordinary numbers, which have the property that they commute: $X \cdot Y = Y \cdot X$, the supersymmetry directions are described by numbers that anti-commute: $X \cdot Y = -Y \cdot X$.

PERTURBUTION THEORY

A useful way of studying theories that cannot be solved exactly is by computing power series expansions in a small parameter. Thus, if T(a) denotes some physical quantity of interest and the first few terms can give a very good approximation. This approach, which is called perturbation theory, is the way superstring theories were studied until recently. The problem is that in superstring theory there is no reason that the expansion parameter a should be small. More significantly, there are important qualitative phenomena that are missed in perturbation theory. The reason is that there are non-perturbative contributions to many physically interesting quantities that have the structure. Such a contribution is completely invisible in perturbation theory.

Perturbative quantum string theory can be formulated by the Feynman sum-over-histories method. This amounts to associating a genus h Riemann surface, which can be visualized as a sphere with h handles attached to it, to the hth term in the string theory perturbation expansion. The genus h surface is identified as the corresponding string theory Feynman diagram. The attractive features of this approach are that there is just one diagram at each order of the perturbation expansion and that each diagram represents an elegant (though complicated) mathematical expression that is ultraviolet finite (no short-distance infinities).

The main drawback of this approach is that it gives no insight into how to go beyond perturbation theory.

D-Branes

Another source of insight into non-perturbative properties of superstring theory has arisen from the study of a special class of p-branes called Dirichlet p-branes (or D-branes for short). The name derives from the boundary conditions assigned to the ends of open strings. The usual open strings of the type I theory satisfy a condition (Neumann boundary condition) that ensures that no momentum flows on or of the end of a string. However, T duality implies the existence of dual open strings with specified positions (Dirichlet boundary conditions) in the dimensions that are T-transformed. More generally, in type II theories, one can consider open strings with specified positions for the end-points in some of the dimensions, which implies that they are forced to end on a preferred surface. At first sight this appears to break the relativistic invariance of the theory, which is paradoxical. The resolution of the paradox is that strings end on a p-dimensional dynamical object -- a D-brane. D-branes had been studied for a number of years, but their significance was explained by Polchinski only recently"http://theory.caltech.edu/people/jhs/strings/ref.html" \l "seven"

The importance of D-branes stems from the fact that they make it possible to study the excitations of the brane using the renormalizable 2D quantum field theory of the open string instead of the non-renormalizable world-volume theory of the D-brane itself. In this way it becomes possible to compute non-perturbative phenomena using perturbative methods. Many (but not all) of the previously identified p-branes are D-branes. Others are related to D-branes by duality symmetries, so that they can also be brought under mathematical control. D-branes have found many interesting applications, but the most remarkable of these concerns the study of black holes. Strominger and Vafa"http://theory.caltech.edu/people/jhs/strings/ref.html" \l "eight" (and subsequently many others) have shown that D-brane techniques can be used to count the quantum microstates associated to classical black hole configurations. The simplest case, which was studied first, is static extremal charged black holes in five dimensions. Strominger and Vafa showed that for large values of the charges the entropy (defined by S = log N, where N is the number of quantum states that system can be in) agrees with the Bekenstein-Hawking prediction (1/4 the area of the event horizon).
This result has been generalized to black holes in 4D as well as to ones that are near extremal (and radiate correctly) or rotating. In my opinion, this is a truly dramatic advance. It has not yet been proved that there is no breakdown of quantum mechanics due to black holes, but I expect

that result to follow in due course.

M-Theory

The understanding of how the IIA and HE theories behave at strong coupling, which is by now well-established, came as quite a surprise. In each of these cases there is an 11th dimension that becomes large at strong coupling. In the IIA case the 11th dimension is a circle, whereas in the HE case it is a line interval (so that the eleven-dimensional space-time has two ten-dimensional boundaries).

The strong coupling limit of either of these theories gives an 11-dimensional space-time. The eleven-dimensional description of the underlying theory is called "M theory." As yet, it is less well understood than the five 10-dimensional string theories.

S Duality

Suppose now that a pair of theories A and B are S-dual. This means that if f denotes any physical observable and l denotes the coupling constant. The expansion parameter a introduced earlier corresponds to l). This duality, whose recognition was the first step in the current revolution, "http://theory.caltech.edu/people/jhs/strings/ref.html" \l "six" generalizes the electric-magnetic symmetry of Maxwell theory. Since the Dirac quantization condition implies that the basic unit of magnetic charge is inversely proportional to the unit of electric charge, their interchange amounts to an inversion of the charge (which is the coupling constant). S duality relates the type I theory to the HO theory and the IIB theory to itself. This explains the strong coupling behavior of those three theories.

T Duality

The basic idea of T duality(for a recent discussion see"http://theory.caltech.edu/people/jhs/strings/ref.html" \l "five") can be illustrated by considering a compact dimension consisting of a circle of radius R. In this case there are two kinds of excitations to consider. The first, which is not special to string theory, are Kaluza--Klein momentum excitations on the circle, which contribute (n/R)2 to the energy squared, where n is an integer. Winding-mode excitations, due to a closed string winding m times around the circular dimension, are special to string theory denotes the string tension (energy per unit length), the contribution to the energy squared is Em=2pmRT. T duality exchanges these two kinds of excitations by exchanging m with n and This is part of an exact map between a T-dual pair A and B.

One implication is that usual geometric concepts break down at short distances, and classical geometry is replaced by "quantum geometry," which is described mathematically by 2D conformal field theory. It also suggests a generalization of the Heisenberg uncertainty principle according to which the best possible spatial resolution Dx is bounded below not only by the reciprocal of the momentum spread, Dp, but also by the string scale Lst. (Including non-perturbative effects, it may be possible to do a little better and reach the Planck scale.)

Two important examples of superstring theories that are T-dual when compactified on a circle are the IIA and IIB theories and the HE and HO theories. These two dualities reduce the number of distinct theories from five to three.

THE MODIFICATION STATED

String Theory came along as an outcrop of another field theory called Supersymmetry. Early work at trying to combine the other two field theories with General Relativity had come upon a method that worked to a point. It started in 1970, when Yoichiro Nambu, of the University of Chicago, came upon an idea of treating fundamental particles not as points, but as tiny 1D objects that became known as strings. At first, since the QED model had been developed this idea was forgotten. Originally, he had sought a way to model hadrons. But initial calculations carried out on these entities described boson like particles with integer spin.

Then Pierre Ramond, of the University of Florida, found a method of adapting them to discribe fermions of half interger spin. These same objects could now combine to form the original bosons. Later, John Schwarz, Joel Scherk, and Andre' Neveu developed a consistent mathematical theory from this. What they noticed was that fermions and bosons emerged from string theory on equal footing It was at this point that the concept of supersymmetry was born.

The next step was finding a way of bringing gravity into the fold. Work on String Theory itself was mostly carried out by John Schwarz and Michael Green during this period. A central theory of supersymmetry or supergravity that devloped during this period was called N=8 Supergravity. It was when people began to realize that the only usable model, N=8 required 11D space-time to work and that during the 1920's not only had Einstein had to resort to higher dimensions to explain gravity, but, earlier in 1919, Theodor Kaluza had found a way to include EM into General Relativity by using a 5D model. From this, others began to relook at the original String Theory because it to required higher dimensions. This was further backed up by the fact that certain String Theory models discribed the same thing as N=8 supergravity.

Now, I will not go into the early development of String Theory any further. What caught everone's attention was the fact that the basic vibrational state of a String actual is identical to the one missing particle needed to bring General Relativity into the fold. That being the spin two bosons or graviton that General Relativity had predicted should exist. That, and the fact, that unlike point particles who's field equations have to be renormalized. This theory required no outside normalization to remove infinites. In fact, it normalizes itself. String Theory replaces the point particle with an extended object and thus avoids that problem. Also, instead of a bunch of particles one is left with a single string who's different vibrational modes produce the different particles.

But in spite of String Theory even in its current form solving a lot of problems (ie. the entropy of blackholes it still has a lot of internal problems. One of these roots back to its foundation of supersyymetry. The other has to do with only perburtive methods have been found to date that give anything near an acurate answer. The other is no one to date has managed to formulate a correct vacuum from the theory like we find in our known space-time.

With SUSY the central idea is that all fermions have their boson counterparts. The problem is that no experiment to date has ever been able to detect them. Another problem most people have is the added dimensions cannot be seen directly in nature either The following modification to M-Theory, while derived from normal String Theory has a different startting point and a different outcome.

The Modification

This theory starts with a pre-inflation state of two seperate and distinct space-times. One was 2D and met the near-Kerr solutions to blackhole geomtrodynamics. It was also smaller than the Plank scale by at least the 50th power. The other was a perfect vacuum state satisfying a spinless Higg's solition in 6D format larger than the 50th power in light years converted to centimeters. At first these two space-times where seperate. But since the 2D one was smaller than the Plank scale it had an infinite probability of undergoing a quantum phase transition. That phase transition ruptured it into fragments of a 3D nature. As, it ruptured, the now 4D space-time became composed of negative energy waves of a specific wavelength. More on this in a moment.

Its rupture caused it to mix into the 6D Higg's space-time and caused that space-time to shrink rapidly as its negative energy was mixed with the positive energy of 6D space-time. This was the start of the inflation period. Now, if the energy of 6D space-time was exactly equal to 1.9999 carried to the 120th place greater than that of 4D space-time one is left with a vacuum state that cancels out exactly as ours does. The point of all this is two fold. One, this does exactly account for the reason inflation took place. It accounts for the shrinking of 6D space-time down to a scale smaller than the Plank scale. It also accounts for a possible reason our universe became matter dominated. The phase difference between the two space-time's fields would have caused an imballance one way or the other in the resulting mix. The inflation period actually becomes an inflation/deflation period. The energy of 4D's inflation was then stored in compacting 6D space-time.

Now, what these two energy waves formed from each of the fragments was a tube within a tube that loops into itself at both ends. These tubes are also expanding and contracting in opposition to each other forming a virbrating standing wave set. Primarily, the outer tube vibrates in its normal state at a wavelength equal to its kenetic energy. This has within it a tube vibrating at its SUSY counterpart wavelength. The total spin in its normal state is that of a graviton when applied against the internal Higg's field.

There are two unique things that one can derive from this simple space-time composite manifold. One, the natural state that the internal field of Higg's space-time trys to return to is its original perfect vacuum state in expanded format. Thus, it attempts to shed the energy it gained during inflation. The natural effect of being combined with 4D space-time is to contract. This process yeilds the curvature effect we call gravity that is explained well with General Relativity. Locally, the energy of 4D space-time causes 6D space-time to compact inward which translates into a curving of the structure of space-time as a whole because the inner field is interconnected in such a fashion that any movement of any single element causes a simular effect that propogates outward in all directions in 4D space-time at the velocity of light.

The other thing that can be noted is that since both sub-spaces or space-times are united. Their resultant should manifest aspects of both sides. This I believe when carefully examined gives the answer to a couple of problems. One is why space-time didn't simply contract back under the effects of gravity in the first place long before the universe as we now see it had a chance to form. Secondly, why recent observations have noticed that the expansion rate of the universe varies with time. Since the energy in Higg's space-time outweighs that of 4D graviton space. Gravity could not crush space-time backwards. Secondly, while locally gravity can be very strong in a confined area. The greater repulsive or expanding force from 6D space-time will eventually over come it on a global scale. Thus, over time the rate of expansion as the over all mass density drops will increase.

Now, I mentioned at the start that this theory solves some basic String Theory problems. It solves the SUSY problem by having them and the Higg's field compacted in 6D space-time, and as such, hidden from our ability to directly view. It solves the problem from cosmology by giving an actual reason for inflation. It explains why old field theory always found the answer for the mass of a naked electron as a negative value or energy level. It explains the wave nature of particles. The structure of the two tubes EM like field explains how a field can be self existant. Since, the original manifold from M-Theory has been changed into a literal two part tube structure of 10D format. There is no perturbitive solution to this theory and the original particle nature has been restored with an extended object that removes infinites from field equations based on this method.

But, this theory when applied to deriving the mass of certain bosons and their coupling constants gives an answer to where they come from and what they are related to. I will not go into the math involved in finding the value of the kenetic energy of a graviton. But, when you add all the coupling constants together you get a value of 1.800730144. If this number is applied to Omega from the mass density formula cosmologists use and then looked at in seperate fashion when applied to the size of the universe at the end of inflation one gets an answer for the mass density of space-time then that agrees with known data. When it is split apart with one part being the omega for 4D space-time and the other being the omega for 6D space-time one also finds a reason for why observations of the structure of the universe have always found the structure to dictate a mass different from what is found. Thus, it answers the old dark matter problem. 4D space time has an omega equal to .1800730144. This value divided by the size of the universe converted to centemeters gives a figure for our current observed side of the universe that equals the known mass density. The 1, as a value, gives the reason space-time remains observationally flat. This is the value from 6D space-time. Together the two give the actual omega value.

This remarkable little result explains how space-time can evolve over time from a closed system, to a flat system, to a system with curvature that gives it a saddle shape and eventually to a closed state without observationally becoming curved from an inside perspective at any point along the way. It also restores a true picture to some recent observations that seems to say the Fine Structure Constant varies with time. Since space-time's expansion rate changes with time. Those redshift effects would be due to that. The Constant would remain constant as would the related speed of light.

Understanding The Particles and Space-time

Picture 10D space-time as the following: We have embeded within a 4D Euclidean space-time manifold, with length element following the normal format. A hypersphere represented by the parameters u, v, w, x, y, z which we express by x=x(u,v,w,x,y,z). Introduce into this a six sphere S3 which restricts X4 from the original set. One has now defined that our 4D space-time has embedded within it a Calibi-Yau sixfold. This is in keeping with normal String Theory. The difference here is that instead of a sheet inscribed in space-time. One has an actual tube that restores the original particle idea without it actually being a point in space-time. This is because the particle remains an extended object which, at its zero wave crest equals the original manifold from normal M-Theory.

The vibration of this tube now has both an inward and outward part. The outward part is the wave action we normally experience from a quantum mechanical perspective. But as the tube is vibrating and expanding outwardly. Its inward part is doing so in an opposite fashion and compacting 6D space-time. It is this compaction of 6D space-time that produces what we call gravity. Since its outer vibration is at a frequency equal that determined by the Plank formula for its energy or mass. Which in the outer case is negative while the inner one is positive. The resulting vibrational wavelength becomes a function of the overall resulting mass which determines how much compaction of 6D space-time and as such, how much curvature.

Preservation of SR and GR under this Theory.

The general theory of relativity is founded on a set of field-equations, formulated by Albert Einstein in 1915, which deal with the gravitational force-field. The bold idea of Einstein was to regard the gravitational force as a property of space-time. Thus, General Relativity is essentially a geometrization of gravitation and its language is the mathematics of differential 4-dimensional geometry - three dimensions for space and one for time. General Relativity saw its advent as an extension of Special Relativity, also owed to Einstein, which is based on the following two assumptions: (an inertial system is a frame of reference in which the velocity of a body is constant unless it is influenced by forces)

· The laws of physics are the same in all inertial systems and no preferred inertial system exists.

· The speed of light in free space is the same in all inertial systems.

Now, since recent observations have found reason to think that the Fine Structure Constant varies over time this would at first imply that the second and first assumptions are incorrect. Indead, no matter how they try to reword it the first would be incorrect since a constant those laws are based upon would be changing. However, this theory does allow for what would appear to be a changing constant without that constant actually changing. If the Space-time field itself as relates to global curvature is allowed to evolve over time then one can have a constant that stays the same, but would have redshift effects simular to those noted in recent experiments. As, the global curvature changed and the overall mass density changed the stretching of the space-time manifold would account for all shifting. Thus, this theory keeps the first assumption as true.

The second assumption can be proved only under a changing constant idea if one limits the inertial system in question to one from the specific time frame being studied. As far as other time frames are concerned it would become false when two seperate history frames where compared. Under this proposed theory, there is no change in the actual constant. Thus, in all inertia frames it remains true.

The Scource of the Wholeness of Space-time

Bell's theorem and its recent generalizations show that an act of observation here and now can affect not only the object being observed -- as Heisenberg told us -- but also an object arbitrarily far away (say, on Andromeda galaxy). This phenomenon -- which Einstein termed ``spooky" -- imposes a radical reevaluation of the traditional mechanistic concepts of space, object and causality, and suggests an alternative worldview in which the universe is characterized by interconnectedness and (w)holism: what physicist David Bohm has called ”implicate order" New Age interpretations of these insights from quantum physics have often gone overboard in unwarranted speculation, but the general soundness of the argument is undeniable.
In Bohr's words, ``Planck's discovery of the elementary quantum of action ...
revealed a feature of wholeness inherent in atomic physics, going far beyond the ancient idea of the limited divisibility of matter."

Now, if you have been following this modification then you already understand why this is so. 6D Space-time has an interconnected nature to it. It is this nature that accounts for the geometric curvature of space-time that we call gravity. It is also the scource of the inter connection noted from Quantum Mechanics. Indead, even though we do not see the reason for this because its scource in compacted. We do understand by experiments that it must be so. Thus, space-time and elementary quantum action must have a wholeness feature.

Chapter 4

First and Second Laws of Thermodynamics Perserved by this Modification.

Ludwig Boltzmann [1] was the first to model the realm of possibilities as ordered and disordered states in the development of the second law of thermodynamics. To explain entropy, Boltzmann generally concluded that the disorder of a closed system increases, because of an imbalance between ordered and disordered states. He reasoned that there is naturally a greater quantity of disordered states compared to ordered states.

Boltzmann also generally envisioned that an axis exists between order and disorder. In one direction along that axis, the number of ordered states decreases toward a state of highest order. In the other direction, the number of disordered states increases notably with some ambiguity. If we assume an aggregate perspective of Boltzmann's model, we can generally identify a wedge shape, closing at the end of highest possible order, where we must presume a single extreme state, while in the other direction there is an endless and indefinite expansion of increasingly disordered states, apparently without end.

Once Boltzmann introduced the second law, others assumed this same conceptualization of order, and came to accept this wedge like model of all possible states as a general description of nature, perhaps without any of the usual scrutiny a fundamental image of nature requires if it is to be maintained. The model has been maintained peaceably, mainly because there has been no challenges and also because the vaguely understood probabilities of such a model have seemed previously to agree with the cosmological behavior of time and the process of microsystems reaching equilibrium.

This system allows for a evolving curvature of space-time and its expansion rate without any violation to these laws. It does so because, not only is the 4D space-time subject to them. But, the actual process whereby the 6D space-time releases its energy stored from inflation is of its very nature due to entropy. The system is simply seeking its lowest energy state which demands the most disordered state and along the other axis the most ordered being a return to its spinless, energyless state.

Accelerated Expansion and the ZPF From A Modification To M-Theory

If one follows the implications of this theory then one is led to the conclusion that the Zero Point Field(the Vacuum) must be a real entity. This is founded upon the following. A 1D harmonic oscillator has states, which can be raised or lowered. This is done in units of N of Planks constant divided by 2Pi times frequency. In terms of momentum P and position Q, the Hamiltonian of the system becomes H=(p**+w**g**)/2. This added to the excitation states have energies acceptable in QM calculations for N Greater than or equal to zero. However, if the kinetic energy or temperature is lowered to zero Kelvin there remains a zero point energy still equal to planks constant/2. If one sums that over frequency a large energy density remains.

Now acceleration through this ZPF causes a particle to acquire inertial mass due to drag no matter what the direction of that motion because the field is uniform in all directions. Also, according to what we have thus established, and in agreement with formula put forth by Duthoff, Haisch, and Rueda in their equations for the ZDF, the ZDF does not gravitate in and of itself. In our theory the energies are such that either field without the other would not gravitate. In fact, even combined both space-time fields have negative and positive values that cancel to the 120th place. This is why the actual experienced ZPF remains low on a global scale. But, it would still produce an EM drag that effects charged particles undergoing acceleration through it.

If one treats the inertial rest mass of a particle as a coordinate in a dimensionally extended space-time then there remains two choices which are mathematically equivelent. These are the gravitational and particle units. When this is applied to a fully-covariant, dimensionally extended theory such as mine that is based upon Riemannian Geometry, these choices transform to coordinate frames.

In this current approach the normal Einstein Field Equations are replaced with a 10D field equation and the vacuum Tensor=o. The equations can then be broken into sets. The first is just regular GR with matter derived from them by virtue of an extra metric coefficient and derivative with respect to the extra coordinates. The second set becomes Maxwell's equation for EM. The next is a conservative equation for the scalar field in the extended metric. The finial ones having to do with the symmetry operations of SU(3), SU(2), U(1) from QED and QCD but here united and incorporated with gravity into one field theory.

What keeps space-time flat and still able to accelerate its expansion rate on an observational level is the energy stored in 6D Higg's Space-time from Inflation.

Varying Cosmological Constant or Omega.

In 1916, Albert Einstein made up his General Theory of Relativity without thinking of a cosmological constant. The view of that time was that the Universe had to be static. Yet, when he tried to model such an universe, he realized he cannot do it unless either he considers a negative pressure of matter (which is a totally unreasonable hypothesis) or he introduces a term (which he called cosmological constant), acting like a repulsive gravitational force. Later, after Hubble and others had discovered the Universe wasn’t static, but expanding Einstein dropped it. More recent observations that have found evidence that the expansion rate changes with time and some of the work with String Theory have caused that term, sometimes referred to as Omega to resurface. But, most people, unless they are cosmologists, physicists, or Astronomers have no idea what this is all about. I will now try to explain the math of it and why based

upon two items I feel it varies over time.
The magnitude of the negative pressure needed for energy conservation is easily found to be P = -u = -rho*c2 where P is the pressure, u is the vacuum energy density, and rho is the equivalent mass density using E = m*c2.

But in General Relativity, pressure has weight, which means that the gravitational acceleration at the edge of a uniform density sphere is not given by
g = GM/R2 = (4*pi/3)*G*rho*R
but is rather given by
g = (4*pi/3)*G*(rho+3P/c2)*R

Now Einstein wanted a static model, which means that g = 0, but he also wanted to have some matter, so rho > 0, and thus he needed P < 0. In fact, by setting
rho(vacuum) = 0.5*rho(matter)
he had a total density of 1.5*rho(matter) and a total pressure of -0.5*rho(matter)*c2 since the pressure from ordinary matter is essentially zero (compared to rho*c2). Thus rho+3P/c2 = 0 and the gravitational acceleration was zero,
g = (4*pi/3)*G*(rho(matter)-2*rho(vacuum))*R = 0
allowing a static Universe.

The basic flaw in Einstein's original model is that it is unstable. Its akin to a pencel ballanced on its point. Soon or later it will fall one way or another. When one considers the results from QM predictions one finds the following. The equations of quantum field theory describing interacting particles and anti-particles of mass M are very hard to solve exactly. With a large amount of mathematical work it is possible to prove that the ground state of this system has an energy that is less than infinity. But there is no obvious reason why the energy of this ground state should be zero. One expects roughly one particle in every volume equal to the Compton wavelength of the particle cubed, which gives a vacuum density of
rho(vacuum) = M4c3/h3 = 1013 [M/proton mass]4 gm/cc
For the highest reasonable elementary particle mass, the Planck mass of 20 micrograms, this density is more than 1091 gm/cc. So there must be a suppression mechanism at work now that reduces the vacuum energy density by at least 120 orders of magnitude.

As I have already laid out in the modification to M-Theory paper, this mechanism is found in the structure of 6D Higg's space-time. But what I haven't done is actual show these as it directly relates to the cosmological constant.

If the supernova data and the CMB data are correct, then the vacuum density is about 75% of the total density now. But at redshift z=2, which occurred 11 Gyr ago for this model if Ho = 65, the vacuum energy density was only 10% of the total density. And 11 Gyr in the future the vacuum density will be 96% of the total density. If one compares this locally within our solar system where we know the masses involved and the distances on finds the following.
a = R*(2*pi/P)2
which has to be equal to the gravitational acceleration worked out above:
a = R*(2*pi/P)2 = g = GM(Sun)/R2 - (8*pi/3)*G*rho(vacuum))*R
If rho(vacuum) = 0 then we get
(4*pi2/GM)*R3 = P2
which is Kepler's Third Law. But if the vacuum density is not zero, then one gets a fractional change in period of
dP/P = (4*pi/3)*R3*rho(vacuum)/M(sun) = rho(vacuum)/rho(bar)
where the average density inside radius R is rho(bar) = M/((4*pi/3)*R3). This can only be checked for planets where we have an independent measurement of the distance from the Sun. The Voyager spacecraft allowed very precise distances to Uranus and Neptune to be determined, and Anderson et al. (1995, ApJ, 448, 885) found that dP/P = (1+/-1) parts per million at Neptune's distance from the Sun. This gives us a Solar System limit of

rho(vacuum) = (5+/-5)*10-18 < 2*10-17 gm/cc. From this we can begin to figure out how much it varies due to the seperation distance between any large body of mass. The cosmological constant will also cause a precession of the perihelion of a planet. Recent data from Mars via the landers and other such mission has produced a value of rho(vacuum) < 2*10-19 gm/cc. It is this last value I believe is most accurate at this time. I believe that more precise data will show that the value of both Omega and rhu varies not only with time. But also with the amount of mass density in any given region of space.

Given the before mentioned formula that C=VR+V, so that, Evuv is gauged from the spin axis of all particles.
Also, given that spin can be either 2, 1, 1/2, -1/2, -1, -2 and other multiplies of these. I wonder what effect slowing of spin by magnetic drag till it was a fractional version would have on the resulting spherical field and its gauging?
Before I go further with this. It is well to remember that gravity, unlike magnetism, seems to only come in a monopole solution within the framework of our space-time. This is in spite of the fact that both polar states are valid. Why then is there a lack of spin -2 gravitons?
The answer must lie either within 4D graviton space, 6D Higgs space, or both. I believe the answer is found in time itself. All reversed gravity solutions require a reversal of the arrow of time. By the following formula wil will demonstrate that time reversal conditions would have drastic effects on the structure of space time. Given that E=MC2. If one looks at any joining of regular time phased matter with reversed time phased matter one finds that the two since their mass' are opposite would exactly nullify each other. This would also be true of their virtual particle products. What would be left is a hole in the structure of our vacuum that cancels to the 120th place where everything cancels. Another words. That sort of reaction would have introduced an area of a different vacuum state.
Now this true vacuum would tend to suck energy in from the state outside of it. Thus in a chain reaction mode it would change the entire vacuum state of our space-time. Now, outside of at creation when a simular joining of two vacuum states gave birth to Inflation, and during the expansion stage when over time that same stored energy gives rise to an increase in expansion this has never been the case again. So some mechanism must be present that prevented the negative gravitons from forming.
That mechanism is why I proposed a near-Kerr 2D solution to Blackhole geometrodynamics as a starting point for this universe. The reason was that that type of Blackhole has a Kruskil format that would generate two separate solutions. That other solution is the answer to the Gravitic Monopole solution. Both were generated at creation in equal amounts. But one half of the solution is separated in another 10D space-time. That other space-time is simular to ours. But its time is reversed.

Minimal Time Interval.

If one is going to use, as, Physicists have recently postulated a "time quantum", a minimum time interval, then that interval must be very small indeed. But, it would have to be also large enough to encompass the smallest particle. That being the graviton. Thus, as the basic tube of string was found to be vibrating in different energy states it would simply be a reflection of an increased tension of those lattice intervals or an increase of stretch of there structure. If, one takes the measurement of the speed of light as 186300 MPS and divides it by 2^59th one gets a size of 9.315^-55 meters for a basic unit. The reason I choice this has to do with the kinetic energy of a graviton as the basic unit in relation to the speed of light. It seemed at least a starting point. Now, if you divide the weak photon by the graviton one gets 1^34. This times 9.315^-55 gives you 9.315^-21. That divided by the 9.315^-55 equals the 1^34.

This translated into an event description says that our original graviton has undergone a minimal time interval change of 1^34th power. A Gluon following this logic would have undergone a 1.01001^39th power interval change. All other particles then become a division of it downwards back to the graviton. Now if C, as an interval of time, equals a time interval of 2^59th basic units. Then a relation of mass to time interval can be established as such.

If one applies this time interval to the Lorentz formula one finds that the Time Interval shrinks as an object or particle are accelerated. This translates to a smaller measuring factor the faster an object moves. Thus, mass will increase.

Thus, there is no problem with the idea some have proposed of establishing a time quanta. In fact, it does establish time as a dimension on equal footing with the other dimensions. One thing time has always lacked is a universal reference point. But lets explore and see what having a universal time reference will do to some other equations. If we apply the Lorentz formula to two separate events one finds that relativity still remains valid. There will be a time difference between a stationary observer and those of an object moving relative to that stationary point of reference. The only difference now is one has a means of universally establishing time anywhere within the universe.

The time difference is as follows. As velocity goes up the time interval increases. This is why mass goes up. What has happened is the time interval has expanded due to drag against the energy of 6D space-time. This is understood as different from what clock time does because the time interval is tied to mass. The point of this whole exercise has been to show that there is an energy to the vacuum and that energy effects the fields of our space-time via a drag effect as an object is accelerated. It is this drag effect that is responsible for inertia. What this drag does is it expands the time interval in the opposite direction to that of acceleration. Which accounts for why the length of an object under acceleration shrinks the faster an object goes. It also shows that the energy of 6D space-time stays the same. What has changed is the energy of 4D space-time.

Another application of this minimal time slice is in the area of Blackholes. If there is a smallest unit of time, and a smallest field element in the since of a String. Then it follows that there is a limit to which gravity can compact space-time. That limit would as such avoid the actual singularity issue. This does not in any fashion take away from the idea of gravity in a local region of space being able to produce a region that light itself cannot escape from. Nor does it effect in any way the proposed theory recently backed up by String Theory that Blackholes do radiate energy back into space-time. What must be remembered is our Strings are not solid objects in the since of the old Newtonian or Atom concept. They are interwoven fields that form space-time. It is their localized energy within a given area that we define as a particle. Not some solid hard substance. The part that is being defined in this case is the smallest amount of that energy that can exist due to the fact that our Strings have a certain smallest vibrational state which has been defined as a graviton. This is well in keeping with regular QM.

Indead, one aspect of QM and the evolution of the Cosmos that has always been ignored is that given the almost universally accepted concept of Inflation. There is a point at which under QM no smaller unit as relates to time can be utilized than that which exists at the border between expansion and inflation. This is because the energies involved in the process of Inflation have a negative quality to them. Even if one could get beyond that point the amount of energy needed by any process to work further backwards goes off the scale. This has been echoed by many when they speak of the infinities that crop up at the Plank scale. But few have ever looked at its implication as relates to Blackhole structure. If infinites crop up at the Plank scale which is far larger than any normal concept of a singular point. Than nothing can ever reach that singularity point unless one choices to redefine that point by the Plank scale limit.

MORE PROOFS

According to recent measurements by Purdue University physicists, the tiny particle may not be a simple negative point charge, as scientists often describe it. "Science and engineering students have learned for

years that the electron has a constant electronic strength, but now we've seen that this may not be the case," says David Koltick, professor of physics at Purdue. Koltick says his research shows that the electromagnetic force from the electron, or its electronic strength, may increase toward the particle's central core.
According to his data, surrounding the electron's core is a fuzzy "cloud" of virtual particles, which wink in and out of existence in pairs. One particle in the pair is positively charged, the other negatively charged. The cloud is polarized, which means that the strong negative charge at the core "pushes" the negatively charged particle in a pair slightly farther away from the core than the positively charged particle. The polarization is strongest toward the center of the cloud. The polarized pairs essentially cancel each other out so that they do not "add" any net electric charge to the electron, Koltick says, but the cloud plays a key role in how we perceive the electromagnetic force from the electron. "The cloud of virtual particles acts like a screen or curtain that shields the true value of the central core," Koltick explains. "As we probe into the cloud, getting closer and closer to the core charge, we 'see' less of the shielding effect and more of the core. This means that the electromagnetic force from the electron as a whole is not constant, but rather gets stronger as we go through the cloud and get closer to the core.
Koltick's results appeared in the Jan. 20 issue of the journal Physical Review Letters.
Koltick and his colleagues also determined that the strong nuclear force, which is the "glue" that holds together elementary particles such as protons, gets weaker closer to the core charge. Other researchers also have seen this effect in the strong force. "Because the electromagnetic charge is in effect becoming stronger as we get closer and the strong force is getting weaker, there is a possibility that these two forces may at some energy be equal," Koltick says. "Many physicists have speculated that when and if this is determined, an entirely new and unique physics may be discovered."
Now, one of the things that I did initially to ascertain some of the missing particle masses was to work backwards with these know fields and the decrease and increase in strength over range to arrive at an equalization point. From there I did the same for other know fields and worked backwards to a point of unification with gravity. Along the line I discovered while playing with these coupling constants that when I took them and added them together then divided the size of the known universe by that sum that I had a figure in line with both the observed matter density and so called Dark Matter density of the Universe. But I also noticed that they, when plugged into those from 6D Higg's space-time, gave a curvature to the universe that evolves with time that made some of the odd data cosmologists and astronomers had been coming across the more they studied the Universe make sence. The theory literally predicted that expansion rate should increase over time from its initial slow down due to gravity. It also indirectly predicted that any observational method of determining certain constants like the Fine Structure Constant would appear to vary with time. Prior to that point I was amongst those that leaned toward an Omega value either equal to 1 or perhaps slightly greater than 1. In fact, I was hoping the whole structure would be found to cycle. I still find some hope in that area. Given the fact that particles can form a closed loop system within themselves. Perhaps even in its end state the Universe can perform the same trick.

NEW GAUGING TOOL

$\bar{C}$=eRvR+e1v1+e2v2.....e10v10 so that velocity is gauged under modified theory. If helical path is constant for the radius from the strings axis of spin, as in a non-accelerating reference frame, then eVuv=e1u1.........e10u10 must be also gauged from the spin axis. If not the resulting direction of light like path would be consistent with C=VR+V at any radius.
Thus, relativity demands a gauge that conserves itself. Now eRuR and C=ecc are such that Uv=uovCco-1, just as UR=uoRcco-1 and c=coPPo-1 where p=RR. Since eRuR corresponds to VR and C=ecc corresponds to C=VR+V. This makes evuv=e1v1.... also correspond to the translational velocity V.
Now, in the absence of an attracting mass the axis of spin would not change. But since the 4D component is interconnect and the 6D component is also co-coupled this inter connection of the space-time manifold does not allow any one set to be isolated. Thus the field remains intrinsically curved in spite of the fact, that, normally it would generate a flat space-time.

CHAPTER 5

GRAVITY WAVES

Gravity waves were postulated by Einstein's theory of gravitation, wherein accelerated masses also produce signals (gravitational waves) that travel only at the speed of light. And, just as electromagnetic waves can make their presence known by the pushing to and fro of electrically charged bodies, so can gravitational waves be detected, in principle, by the tugging to and fro of massive bodies. However, because the coupling of gravitational forces to masses is intrinsically much weaker than the coupling of electromagnetic forces to charges, the generation and detection of gravitational radiation are much more difficult than those of electromagnetic radiation. Indeed, since the time of Einstein's invention of general relativity in 1916, there has yet to be a single instance of the detection of gravitational waves that is direct and undisputed.

There are, however, some indirect pieces of evidence that accelerated astronomical masses do emit gravitational radiation. The most convincing concerns radio-timing observations of a pulsar located in a binary star system with an orbital period of 7.75 hours. This object, discovered in 1974, has a pulse period of about 59 milliseconds that varies by about one part in 1,000 every 7.75 hours. Interpreted as Doppler shifts, these variations imply orbital velocities on the order of 1/1000 the speed of light. The non-sinusoidal shape of the velocity curve with time allows a deduction that the orbit is quite noncircular (indeed, an ellipse of eccentricity 0.62 whose long axis precesses in space by 4.2 per year). It is now believed that the system is composed of two neutron stars, each having a mass of about 1.4 solar masses, with a semi-major axis separation of only 2.8 solar radii. According to Einstein's theory of general relativity, such a system ought to be losing orbital energy through the radiation of gravitational waves at a rate that would cause them to spiral together on a time scale of about 3 108 years. The observed decrease in the orbital period in the years since the discovery of the binary pulsar does indeed indicate that the two stars are spiraling toward one another at exactly the predicted rate.

Gravitational waves have a polarization pattern that causes objects to expand in one direction, while contracting in the perpendicular direction. That is, they have spin two. This is because gravity waves are fluctuations in the tensor metric of space-time. All oscillating radiation fields can be quantized, and in the case of gravity, the intermediate boson is called the "graviton" in analogy with the photon. But quantum gravity is hard, for several reasons:

The quantum field theory of gravity is hard, because gauge interactions of spin-two fields are not renormalizable. See Cheng and Li, Gauge Theory of Elementary Particle Physics (search for "power counting").

There are conceptual problems - what does it mean to quantize geometry, or space-time? It is possible to quantize weak fluctuations in the gravitational field. This gives rise to the spin-2 graviton. But full quantum gravity has so far escaped formulation. It is not likely to look much like the other quantum field theories. In addition, there are models of gravity which include additional bosons with different spins. Some are the consequence of non-Einsteinian models, such as Brans-Dicke which has a spin-0 component. Others are included by hand, to give "fifth force" components to gravity. For example, if you want to add a weak repulsive short range component, you will need a massive spin-1

boson. (Even-spin bosons always attract. Odd-spin bosons can attract or repel.) If antigravity is real, then this has implications for the boson spectrum as well.
The spin-two polarization provides the method of detection. Most experiments to date use a "Weber bar." This is a cylindrical, very massive, bar suspended by fine wire, free to oscillate in response to a passing graviton. A high-sensitivity, low noise, capacitive transducer can turn the oscillations of the bar into an electric signal for analysis. So far such searches have failed. But they are expected to be insufficiently sensitive for typical radiation intensity from known types of sources.
A more sensitive technique uses very long baseline laser interferometry. This is the principle of LIGO (Laser Interferometric Gravity wave Observatory). This is a two-armed detector, with perpendicular laser beams each travelling several km before meeting to produce an interference pattern which fluctuates if a gravity wave distorts the geometry of the detector. To eliminate noise from seismic effects as well as human noise sources, two detectors separated by hundreds to thousands of miles are necessary. A coincidence measurement then provides evidence of gravitational radiation. In order to determine the source of the signal, a third detector, far from either of the first two, would be necessary. Timing differences in the arrival of the signal to the three detectors would allow triangulation of the angular position in the sky of the signal.
The speed of gravitational radiation (Cgw) depends upon the specific model of Gravitation that you use. There are quite a few competing models (all consistent with all experiments to date) including of course Einstein's but also Brans-Dicke and several families of others. All metric models can support gravity waves. But not all predict radiation travelling at Cgw = Cem. (Cem is the speed of electromagnetic waves.) There is a class of theories with "prior geometry", in which, as I understand it, there is an additional metric which does not depend only on the local matter density. In such theories, Cgw != Cem in general.
However, there is good evidence that Cgw is in fact at least almost Cem. We observe high energy cosmic rays in the 1020 to 1021 eV region. Such particles are travelling at up to (1-10-18)*Cem. If Cgw < Cem, then particles with Cgw < v < Cem will radiate Cherenkov gravitational radiation into the vacuum, and decelerate from the back reaction. So evidence of these very fast cosmic rays is good evidence that Cgw >= (1-10-18)*Cem, very close indeed to Cem. Bottom line: in a purely Einsteinian universe, Cgw = Cem. However, a class of models not yet ruled out experimentally does make other predictions.

PARTICLES AS INTERSECTION OF FIELD LINES

Given the illustration at the side. Also given the before mentioned tube within a tube structure due to the intersection of the fields of 4D Graviton Space-time and 6D Higg's Space-time. One can begin to establish a model of particles that shows them to be distortions in the field lines of a unified 10D Space-time. In the case of the electron. The reason one finds the energy of the system increasing, as recent experiments have shown, the closer one gets to the center is because those field lines of basic time/energy units gets more compacted the

further in one goes. The reason the opposite result is found
when our Electron is replaced with a gluon is that its field has been modified by different Gauging factors in
6D Higgs' space-time to one that works the opposite of the electric field.

When all of this is applied to the Gravity field we find a more basic picture. The individual gravitons are
wielded onto the background sub-space of 6D Higgs' Space-time. Thus, any compaction of it will translate
into a shifting of the graviton particles that propagates wavelike from the source outward both locally and
globally. If one can us the image at the side. The gravitons are the individual elements of the greater over
all field they form. Even though the real field isn't a mesh like the one employed in this simulation. The
individual sides of each square would be an individual graviton.

When this is compared to the old Standing Wave Theory as illustrated below
And then compared to yet another image of standing waves interacting within the confines of a given
volume of space-time you begin to see why that older theory was so accepted. You also get a bit closer to
the before mentioned concept of compacted field lines forming particles. Indead, the diffraction pattern is
nearly the same as that of overlapping field
lines themselves.

Back Research that supports My Theory.

Further, note that Dirac as shown in this quote from pages 194-195 of Dirac: A Scientific Biography, by Helge Kragh (Cambridge 1990): "... "... It would appear here that we have a
Contradiction with elementary ideas of causality. The electron seems to know about the pulse
before it arrives and to get up an acceleration (as the equations of motion allow it to do), just
sufficient to balance the effect of the pulse when it does arrive." Dirac seemed to accept this
pre-acceleration as a matter of fact, necessitated by the equations, and did not discuss it further.
However, Dirac explained that the strange behavior of electrons in this theory could be understood if the electron was thought of as an extended particle with a nonlocal interior. He
suggested that the point electron, embedded in its own radiation field, be interpreted as a sphere of radius a, where a is the distance within which an incoming pulse must arrive before

the electron accelerates appreciably. With this interpretation he showed that it was possible for a signal to be propagated faster than light through the interior of the electron. He wrote: "The finite size of the electron now reappears in a new sense, the interior of the electron being a region of failure, not of the field equations of electromagnetic theory, but of some of the elementary properties of space-time." In spite of the appearance of superluminal velocities, Dirac's theory was Lorentz-invariant. ...".

As I mentioned within my Theory the compacted 6D Higgs space which is at the center of all particles, including the electron has a space-time element different from our outside 4D reference. Since the distance between any two points in that space-time is smaller the velocity of propagation inside would be faster than light in relation to the outside reference. Thus, Dirac and men like those who wrote the Compton Radius Vortex model have anticipated key aspects of this same Theory.

Another backup is found in the Compton Radius Vortex Model. For any finite non-zero Spin J, Mass $M = 0$ implies that $a = J / M$ is infinite, so that the Ring Singularity at $z = 0$ has infinite radius, at $x^2 + y^2 = a^2$; the Outer Event Horizon at $r = r+ = + \sqrt{- a^2}$ is infinite and Complex; the Inner Event Horizon at $r = r- = - \sqrt{- a^2}$ is also infinite and Complex; the Ergosphere at $r = + \sqrt{- a^2 \cos^2(T)}$ is infinite and Complex, but with a hole at poles of the z-axis.

From the point of view of a Photon, our entire physical universe is the interior of a Kerr-Newman Blackhole Compton Radius Vortex, so that all massless particles may can be described by 4D Complex-Dimensional fields and Penrose Twisters. Now, while I agree that the math of both do give a good description I feel that all massless particles would exist within a universe view like the interior of a Near-Kerr-Newman Blackhole. As such, while part can be described by Complex 4D fields. The interior requires a different manifold of a 6D Higgs type to satisfy the requirements of SR, GR, and both QED & QCD. However, I believe that since the space-time of both sub-spaces describes something that is large, but finite and unbounded that the before mentioned Compton Radius Vortex Model has to be modified so that the answers remain complex, but not infinite.

(1+1)-dimensional Sine Gordon Solution Pion

The effective (1+1)-dimensionality of the Pion's constituent Quark and AntiQuark is due to the fact that the Quark and AntiQuark are confined to the Pion and therefore interact at the surface boundaries of their Compton Radius Vortices, so that their Ring Singularities are effectively Naked Singularities with only 1 spatial dimension, that of the Blackhole at $z=0$ and $x^2+y^2=a^2$. Now within my Theory, while the Quark and Anti-Quark remain true particles, their confinement is due to a more confined radius. Thus, effectively they would have a ring singularity area that satisfies z= to plank radius and $x^2+y^2=a^2$. As such the two theories would predict a confinement of quarks to vastly finite area. Since the separation of any quark from its natural state would require an energy that grows with the distance. The Quark remains a confined system in all cases excepting those of energies approaching that of unification itself.

In fact, this same effect can be extended to the proton with its three Quark binding system. In both cases the outer 4D space-time field and the inner 6D space-time fields are generated by those inner quark field models. The same holds true for the Compton Radius Vortices models.

The O(3) Model

Rajaraman says "... What would happen if we ... directly generalize the O(3) model to N real scalar fields ... [PHI_n with the sum over n of PHI_n^2 = 1 ?] ... the allowed values of the field, subject to [the sum over n of PHI_n^2 = 1] ... , now fall on the surface of a hypersphere S(N-1) imbedded in N dimensions. Consequently the holonomy group of localized solutions would now be PI_2(S(N-1)). ... this group is trivial except when N = 3. Consequently non-trivial instanton sectors for the ... O(N) model will exist only when N = 3. ... Consequently, the O(3) model's results cannot be generalized by going to an O(N) model with N greater

than 3.
(see Din and Zakrewski, Nucl. Phys. B168 (1980) 173) ... the O(3) model in (1+1) dimensions
has several interesting properties, many of them similar to the Yang-Mills theory in (3+1) dimensions. Both systems yield instantons characterized by integer-valued topological indices. ...
both models [are] scale invariant and [yield] instantons of arbitrary size. (At the quantum level,
the similarities persist. ... both the O(3) and Yang-Mills theories are renormalisable and asymptotically free.) At the same time, the O(3) model is comparatively simple. It consists of
only three scalar fields in its two dimensions with a simple Lagrangian [L given by L = (1/2)
(d_m PHI).(d^m PHI) where] ... PHI can be considered as a vector in
[which is] distinguished from vectors in coordinate space , which are labeled by Lorentz indices,
such as [m in the above equation for L] ... both the Lagrangian ... and the constraint [sum over
n of PHI_n^2 = 1] are invariant under global O(3) rotations in Internal Symmetry Space.
Since Spin(3) = SU(2), the 3-real-dimensional Internal Symmetry Space on which O(3) acts in

the O(3) Model can be transformed into a 2-complex-dimensional Internal Symmetry Space
that is acted upon by SU(2). Since SU(2) acts globally on the symmetric space SU(2) / U(1) =
S3 / S1 = S2 = CP1, where CP1 is Complex Projective 1-space
the CP1 model is essentially the same as the O(3) model, which also follows the same line as this
Theory does but with the inclusion of gravity into the same general fold from both a particle and
geometric perspective. Thus, this Theory manages to do something that the older CP1 & O(3)
models could not do.

INCORPORATION OF WEAKON MODEL WITHIN.

Weakons. The nature of weakons can be described in much the same terms that were used to
describe the photon above. Weakons are also spin 1 bosons, for they are the gauge particles of
the weak force. Given or theory about the nature of quantum matter, we assume that weakons
are constituted by cycles of quantum events, and thus, what makes them different from photons is presumably coinciding with space in a different way.
Rest mass. One basic difference between photons and weakons is that weakons have a

rest
mass, whereas photons are massless. Indeed, weakons have a sizable rest mass, about 80,000
MeV/c2 for the charged weakons and over 90,000 MeV/c2 for the neutral weakon. That is
nearly one hundred times the rest mass of the proton.
Rest mass is the property that made it impossible to explain weakons as the gauge particle of
the weak field on the model of photons in the electromagnetic field, since gauge bosons are
massless, according to Yang-Mills field theory. What makes Yang-Mills field theory so attractive is that particles interact the same way regardless of scale. They are, in other words, gauge invariant. But if one simply assumes that gauge particles have a rest mass, then the
particles are no longer invariant under a gauge transformation. When the relevant particles are
described on a much smaller scale, as if we were looking at them through a microscope, their
mass decreases to the vanishing point. Mass in not gauge invariant.

In order to give the gauge particle of the weak field a rest mass, therefore, physicists postulate another kind of particle, the Higgs boson, which is the gauge boson of yet another
field. Unlike the weakon and the photon, which have a spin of 1, the Higgs boson has a spin of
0, meaning that it does not line up at all in the magnetic field. But it gives weakons a mass, only if
Higgs bosons are located everywhere in space. Thus, it is assumed that the Higgs field is in a
condition of least energy when there are Higgs particles everywhere. But the Higgs boson is a
force with a certain strength (which enables the weakon to resist acceleration so that it tends to
stay at rest), and so that is to say that the Higgs field has least energy when its force is strongest
everywhere. This is paradoxical, because the energy associated with every other force of nature increases with the strength of the force.

Notice, however, that although this description of what gives the weakon a rest mass is paradoxical only when it is assumed that it is a description of matter. It is not paradoxical at all
as a description of space. Space has no energy (it is not matter), but since it is a substance, it
can exert a force. If the weakon's relationship to space is what gives it a rest mass, it is not
surprising that the force is exerted everywhere. Nor is it surprising that that is the

condition of least energy, because it does not involve any energy at all. Thus, since we have already postulated the existence of space as a substance for other reasons, we can explain the rest mass of weakons without postulating Higgs bosons. We can take talk of Higgs particles to be a way of referring to space.

The function of the Higgs mechanism can be served by recognizing that quantum cycle have another way of coinciding with space. Instead of being picked up by the inherent motion and laying out their cycles as a certain wavelength in space, the quantum cycles of weakons have a purely rotational motion, and so they can be at rest in space. We assume that when quantum cycles coincide with space at rest, their matter has the form of rest mass, that is, the matter resists acceleration by a force. Weakons can, of course, be accelerated, and their rest mass determines, as we have seen, the scale of the quantum kinetic cycles that move these particles across space as time passes. But that role of rest mass comes from their relationship to space, not to Higgs bosons.

Like photons, weakons are bosons with an intrinsic spin of 1. That means that there are three different ways that a weakon and interact in a magnetic field. That means, as we shall assume, that each and every weakon has all threeways of interacting, and which way they interact depends on how they are oriented in the field. Taken geometrically, each way of interacting in a magnetic field can be pictured as a different face of the particle

To a certain extent, the picture this modification to M-Theory describes of particles is of a vibrating tube with angular momentum. To the extent that both of these theories describe a similar item then it can be said that they are different methods of describing the same thing. With the Weakon Model, the particles spin determines the face or worldview of that particle. In this theory, the same particle can be modified into different particles. Thus, there has been a face change. However, in this model there are other reasons for that face change.
The Weakon Model was based upon the Spatiomaterialist Theory.

The Spatiomaterialist Theory.

A spatiomaterialist theory of basic particles. The basic particles of physics are described by mathematical theories, which have been accepted as the best efficient-cause explanation of precise, surprising measurements, and they constrain what can be said about basic particles in many subtle ways. What I will present here is, by contrast, a mostly geometrical story about the basic particles, or rather, the beginnings of a geometrical theory. It comes from using spatiomaterialism and its explanation of other parts of physics to constrain further our beliefs about the basic particles. They must be constituted by bits of matter that coincide with space in some way or another, and since space has a three dimensional geometrical structure with an inherent motion connecting all the parts of space in time, these most basic forms of matter must have a spatio-temporal structure of some kind. What is presented here is one way that could be true. There may be other ways it could be true. And the one presented here is merely the model for a set of more specific theories that may be elaborated in different ways. My purpose is to show how adding the ontological constraints of spatiomaterialism to the mathematical constraints of the standard model opens up the possibility of a geometrical model of the basic particles.

It is, once again, an ontological explanation of why current theories about the basic particles are true, and its advantage over purely mathematical theories is that it reduces the number of basic assumptions that need to be made. To be sure, spatiomaterialism makes a big assumption that contemporary physics does not make - that space is a substance enduring through time, indeed, one with an inherent motion. But that will enable us to reduce the 37 particles recognized as basic by contemporary physics to, at most, only ten particles. Or even fewer, it might be argued, though that issue can be put off until we discover whether such ontologically based speculation is useful.

The ten basic particles we shall postulate are the photon, the three weakons, W-, W+, and Z0, three neutrinos, electron, muon and tau, and their three antineutrinos. In one way or another, each involves a new assumption about the nature of matter, space and how they are related.

But it is conceivable that the photon can be explained as another form of weakon, and the

six neutrinos may be just properties of space, that is, aspects of its relationship to weakon.
Hence, a spatiomaterialist world may be made of nothing but space and three kinds of weakons.

This explanation of the nature of the basic particles is based on the assumptions we have already made about the nature of matter in order to explain the truth of the basic laws of classical physics, relativity theory, and quantum mechanics. Quantum matter is ultimately constituted by quantum events, which are basic and can coincide with space in various ways,
and since they are cyclic, they constitute bits of matter that endure through time. The total energy or mass of a bit of quantum matter is simply the number of quantum cycles per second
that constitute its existence. Since the photon is the simplest and plainest form of quantum event
that we considered, let me recall what has been said about it.

An independently existing photon is a complete cycle of electric and magnetic forces. Those forces interact in a way that enables them to be repeated indefinitely. But since each
cycle is a quantum event with the size of Planck's constant, h, it either occurs as a whole or not
at all. The total energy, or matter, in a photon depends on the number of cycles per second, as
required by the physical law, $E = hf$. But the photon coincides with space in a way that makes
it move with the inherent motion in some direction of space. Thus, it also has a wavelength, l,
which is inversely proportional to its momentum, as required by the equation, $p = h/l$.

The photon has an intrinsic spin of 1, which implies that there are three different ways it could be oriented in a magnetic field. Two faces have a magnetic moment, positive or negative,
corresponding to the two ways that light can be polarized. (If you follow the photon through
space, the electric force rotates around to the right or left in space, which determines it circular
polarization, but the difference between these properties is quantum mechanically equivalent to
photons being polarized in mutually perpendicular directions as they pass through a filter.) And
the third way that a spin 1 boson can interact in a magnetic field involves having no magnetic
moment at all, as if there were a face in which the two possible orientations of spin were perfectly balanced. But the photon apparently loses the ability to interact from that zero face,

as some will call it, because it is moving through space with the inherent motion.

Though the photon has energy, it has no rest mass. It might make it seem that its energy must come from its motion across space, like a form of kinetic energy. But that is not quite right,
if its motion is due to the inherent motion in space. We are assuming that its energy comes from
the cycles of quantum actions that are carried out by the exertion of electric and magnetic forces.

The photon is the gauge boson of the electromagnetic field, and on our ontological interpretation of gauge field theories, that means that electric and magnetic forces arise from
space to act on a particle with an electric charge when it moves across space. At rest, the charged particle is a pulsating force in the surrounding space, which is synchronized with the
pulsations of particles with the same charge throughout the universe (and 1800 out of phase with
the pulsations of particles with the opposite charge). Since a magnetic force is also involved, it is
a complex pulsation, perhaps, with internal cycles in two different planes. The electric and
magnetic forces that arise from space to keep its pulsations in synch as the charged particle
moves across space are the electric and magnetic forces, which were described by Maxwell.
They are the same forces that can be coupled and exist independently as photons (for example,
as a result of charged objects oscillating back and forth, as in antennas).

The photon introduces most of the properties that basic objects have, and in order to explain the other basic particles, we must postulate the existence of two other varieties of particles, weakons and neutrinos. All the other particles, both charged leptons and quarks, will
be explained as combinations of neutrinos and weakons. The interaction between them is the
weak force, on this ontological theory.

Now, the Modification to M-Theory does have all particles as a combination. But, it is not of neutrinos and weakons. They are combinations of two basic fields. Thus, while there are
similarities within the two. There is also a vast difference between the two. Proof against Spatiomaterialist Theory comes from several places. They are General Relativity, Inflation
Theory, Quantum Mechanics, And String Theory. Since the advent of field theory it has been

an accepted and vastly proved fact that matter, as we now know it, is actually an effect of the specific properties of a combination of fields we call space-time. The Foundation of their theory is that space/time are infinite. But logic, math, and science has proven over and over again that an infinite set or sets can, by its very nature, only generate another infinite set. Then since, matter is finite. It also follows that space-time must also be finite. Their theory tries to confine matters need to be infinite. But, infinites by nature defy confinement, excepting in the case of a mathematical trickery used in early field theory called renormalization, whereby, the infinities are canceled by the introduction of another negative infinite set to counteract the original so that a proper answer can be derived. But even here that method is unnatural and adhoc. Indeed, the crown of String Theory and of any theory derived from it is the finding of a natural method that flows by nature to account for specific values for particles without the need of renormalization in an adhoc fashion. In this theory, both sides do generate opposite infinites in the form of virtual particles from the vacuum. But, the very nature of those fields is such that by nature they cancel each other out not only locally around a particle. But, also, globally on the scale of the whole of space-time. Thus, the before mentioned theory is to be rejected.

INFLATION THEORY.

There is a variant of the big bang theory, the so-called inflationary view, due to Alan Guth, which holds that there was a period of very rapid, accelerating expansion very early on (10-33 seconds after the big bang). In one billionth the time it takes light to cross the diameter of an atomic nucleus, there was a huge expansion, increasing distances in space on the order of 1050 times. This would transform submicroscopic distances into cosmic distances, and the reason for this late addition to the big bang theory is that it would explain why the temperature of the universe is the same no matter how far we look in any direction from earth. Without this early inflation, the big bang would have results in a very lumpy universe. But it implies that the universe is much larger than the visible universe, though still finite.

Now, one problem that Inflation Theory has always attempted to find an answer to is the fact that naturally within the normal theory this universe should have ended up a net zero because equal amounts of matter and anti-matter should have been formed. But, as mentioned before, this theory not only demands inflation and accounts for it. The very nature of that inflation process dictates that space-time would have had a slight imbalance of either one or the other. The reason for this is seen in the conversion of both sub-spaces into a wave function. One side becomes phased slightly ahead of the other. It was that slight phase difference that determined the outcome. But, it must also be noted that this actual outcome was itself determined by the value of the energy present. In theory, given Quantum Probability, there was a fifty fifty chance on the outcome.

Evidence from varying Fine Structure Constant

Recently there was described the results of a search for time variability of the fine structure constant Alpha using absorption systems in the spectra of distant quasars. Three large optical data sets and two 21 cm and mm absorption systems provide four independent samples, spanning ~23% to 87% of the age of the universe. Each sample yields a smaller Alpha in the past and the optical sample shows a 4 deviation: Alpha /Alpha= -0.7Â¡ over the red shift range 0.5<Z<3.5. potentially significant systematic effects push Alpha/Alpha towards positive values; i.e., our results would become more significant were we to correct for them.

Now the experiment was based upon the measurement of radiation emitted by distant Quasars. This radiation was absorbed by gas clouds. They found that the radiation emitted back by those clouds had its wavelength shifted slightly over time. But, since the above theory has its geometry stretched over time at a varying rate as established by recent observations, the Fine Structure Constant and the Speed of Light would remain constant. The wavelength shift is due to the changes in the structure of space-time itself. Thus, I feel that the recent observation is actually a proof of this theory and that the theory itself need not be modified.

EXPANSION OF UNIVERSE AND THE RED SHIFT.

Theoretical physicists have built up models for the evolution of the universe. The pioneers in this

new science were Friedmann and Lematre. In a very simple way, the Einstein's equation exhibit
three kinds of evolution :
by an Euclidean geometry i.e. it is not curved or in other words its curvature is zero. The stationary state is however asymptotic i.e. the universe tends to reach this state. That means
that a universe with a zero curvature expands until it reaches a given boundary.

Â· An expanding universe. This kind of universe expands forever (as opposed to a stationary universe the expansion is not asymptotic i.e. there is no limit). Its curvature is negative which implies that it is infinite (more precisely, the geodesics are opened).

Â· A contracting universe. Such a universe is crunching until it collapses into a unique point
with an infinite density (physicists call such a point a singularity). Its curvature is positive
(such as a sphere) and the geodesics are closed loops.

Â· An oscillating universe which alternates expanding and contracting phases.

Originally, the observed red-shift and the expansion it implies were compatible with a stationary universe, an expanding one or an oscillating one in expansion phase. It did not help
astrophysicist determine which kind of universe is ours. But the above mentioned results and
those from recent observations that show the expansion rate to accelerate over time better fit a
universe that evolves through these stages which is exactly what this modification to M-Theory
dictates. Indeed, the evolution has been from a closed, to flat, to open type. Now while, we
cannot at present prove the end state. If the above theory is correct that end will be a closed
system. Again, I feel proof of the above theory has been found.

Support from QM Itself.

In the formalism of quantum mechanics the possible states of a system are described by a state
vector (SV), a function (usually complex) which depends on position, momentum, time, energy,
spin and isospin variables, etc. The SV (which will be represented as |S> in the notation of
Dirac) is the most general form of the quantum mechanical wave function. The central problem
of the interpretation of the QM formalism is to explain the physical significance of the

SV. But,
as already established within this Theory, since the particle becomes the smeared out wavefuction. The state vector (SV) must be seen as an exact function of the particle in question
with the variables of position, momentum, time, energy, spin, etc. As such, if one confines any
experiments based upon these factors to a localized frame one has limited that original wavefuction and as such caused it to collapse. This is the actual generator of the The uncertainty principle of Heisenburg.

It may seem surprising that the interpretation of a physical theory can perform the function
of avoiding "paradoxes", i.e., internal contradictions and conflicts with other established theories.
It is therefore useful to consider some examples. Newton's second law, F=ma, is of no physical
significance until the symbol F is identified as a vector representing force, a as a vector representing acceleration, and m as a scalar representing mass. Further, while F and a can have
any (real) magnitude and direction, the formalism is interpreted as meaningful only when m>0.
This is because zero and negative masses lead to unphysical (or paradoxical) results, e.g., infinite acceleration or acceleration in a direction opposite that of the force vector.

Or consider the Lorentz transformations of special relativity for the case v>c. Until fairly recently physicists had always applied to this case Interpretation A: "The transformations with
v>c produce unphysical imaginary values for the transformed variables and are therefore meaningless." But, recent work in M-Theory has shown that Tacyon states can be interpreted
within the QM framework without encountering problems. This theory, since derived from M-
Theory follows that same line and indeed establishes a reason for them from the topology and
structure of 6D Higgs space-time. Thus, this theory finds root proof again from QM and from
recent observations. The uncertainty principle is just a manifestation of the requirement that a
given transaction going to completion can project out only one of a pair of conjugate variables. This being due to the collapse of the wavefuction under the confinement of observation. But at
the same time, when viewed as a complete wavefuction and the structure of space-time there is
also a more complete answer to the old photon/slit experiments. Indeed, the actual photon does only enter one slit. The other pattern is a product of ghost vibrations in the space-time

structure. One is real. The other is a shadow image or copy of the real Photon. As such, it must be noted that to a certain extent my theory supports the transactional approach or i interpretation of QM. It also helps remove some of the stumbling blocks normal QM has Generated.

Is space-time Curved?

1. The rate of expansion is measurable by H, the Hubble parameter (so many km/sec/mpc, where mpc is megaparsec, 3.26 million light years). Since km and mpc are both measures of length, they cancel each other out dimensionally and so H can be restated as (constant/sec), which implies the "age" of the expansion; i.e., the surface has been expanding for exactly 1/H seconds.
2. Light (c) is confined to the surface, and nothing blocks our view as we look farther out along the surface, not even our "back side" when we look around it once.

The spherical surface is infinitely elastic which means it has expanded from a Euclidean point 1/H seconds ago, when t = 0.

3. At some time during the expansion phase we're deposited on the surface at Point A, and there are 24 other Points identified - A through G and I through Z - distributed at various distances and directions along the surface. (H has been used for the Hubble parameter.)
4. Every one of the 25 identified points which seems to be moving "away" from all the other points along 4 degrees of freedom is actually restricted to (much slower) movement along the radius at right angles to the surface, either toward or away from the center of the sphere. But since light is confined to the surface, we're not able to detect any movement whatsoever along this hidden third "degree of freedom".

We cannot avoid looking back in time since light travels at a finite velocity. But we can't look back in time forever. We can only look back in time for 1/H seconds (probably via multiple circuits) at which point we'll observe the spherical surface in its dimensionless t = 0 state. In other words we're assuming that we can look out along the surface until it literally vanishes 1/H seconds ago when t = 0.

Well, not quite...The farther we look out along the surface, the faster objects are receding. When we look far enough away so that we're looking back in time 1/H seconds, the distance we're looking across is c/H. Any position at that distance is receding at the speed of light, and we can't quite see anything receding that fast; it's just over our observable horizon.

But remember the respective movements of the 25 points we've identified are restricted to radii from the central t = 0 position to the surface (i.e., along that hidden degree of freedom). As we look farther out along the surface and farther back in time, then each point on the surface (necessarily observed at an earlier time) is moving toward the collapsed t = 0 central location. So when t approaches 0, then r also approaches zero, and any point designated by (x,y,z) likewise approaches zero. And if we define all points, including Point A, to exist at the t = 0 position, we must have global curvature.

Apparently it's possible to define Point A and all other 24 points to exist at the receding t = 0 position. And we're going to look toward this position along a route that seems "straight" regardless of what the ultimate structure is. If we define the collapsed site in this way, then we know there is global curvature necessarily caused by the elusive extra dimensions that we can't observe directly. The z dimension must be there; otherwise our point would never be defined to exist at another location toward which we can look. And so all points, including our own, must be moving along those hidden degrees of freedom (aka "extra" dimensions) we'll never notice even though we can deduce that it has to be there.

Whether the surface is curved or not, whether there is hidden spatial dimensions or not, and whether the surface is multiply connected or not all depend on how we define the receding site. If points A though G and I through Z are defined to exist at the collapsed central location we will consider this site to be "full". "Empty" will describe the collapsed position with the slightest deviation from the "full" condition.

Characteristics 1 through 3 of this spherical surface are equally applicable to the universe with these exceptions: (1) H is not a constant (it has traditionally been thought to slow down, although there is now evidence to suggest it speeds up); (2) the early universe is opaque to light transmission and so we can't see all the way back to the t = 0 position (which we can't see anyway); and (3) if the inflationary model is correct, space in the very early universe (when its "age" is 10-35 seconds) expands faster than light.

Characteristic 4 can be modified by assuming we still occupy Point A, with the other 24 points spatially distributed at different distances and directions.

But there still is a t = 0 position called the "singularity" which lies about 12 to 15 billion light years away in every direction and which we always toward along a route that seems "straight". If we define all 25 points to exist at the singularity, we must have a universe with ab initio curvature, the type of universe defined by this theory. And that's not exactly an outrageous assumption because these 25 points don't start separating until t > 0; at t = 0 they're together!

Cosmologists routinely refer to the singularity as containing the entire universe at the beginning of time. If "entire" is another name for "full" this means all points, including our own, are defined to exist at another location toward which we can look and this interpretation favors the multidimensional hypersphere in 10 or 11 dimensions. By 11 I am includding time for those hidden dimensions.

This brings us to the extra dimensional Theory.

Any structure expanding according to the Hubble parameter H in such a manner that it's possible to look toward the receding collapsed position at our Hubble horizon - with a look back time of 1/H seconds if the expansion is constant or not - necessarily has one or more hidden spatial dimension which causes global curvature in addition to the spatial dimensions obvious to the inhabitants.

The reason the EDT works is because any two points separating after the expansion starts - say, our own and any other - don't start moving apart until t > 0. On any infinitely elastic structure, both points automatically exist at virtually the same dimensionless site when t = 0. If we're able look toward the receding collapsed site when t = 0 (even if it's not within our Hubble horizon) we can deduce ab initio curvature. Such curvature must exist; otherwise the point from which we make our observation would never be defined to reside at another site toward which we look.

MOD TO M-THOERY A FIMM APPROACH

Spatial processes are "behaviors" of spatial objects. "Interacting spatial processes" refers

to a
phenomenon that occurs when multiple processes influence the response variable of interest.
The interactions are often non- linear, and the observation systems induce scale dependency of
the various interacting processes.

Spatial objects are modeled in two unrelated ways. First, the behaviors of objects are modeled as processes that are independent of the objects. Second, the status (data) of spatial
objects are modeled as separate data layers in a GIS database. The communication between
spatial objects (spatial interaction) is difficult to represent because spatial objects are not perceived as objects in a GIS environment. This has been some of the problem the area od

String Theory has had.

The basic research question is "How can we use the object-oriented (OO) approach to model spatial objects in String Theory so that spatial processes can be modeled as the behaviors of these objects?" Following the OO approach, the interactions between spatial processes can be viewed as the "messages" communicated between sets of spatial objects interlinked in a physical environment. These behaviors of spatial objects are now modeled
independently of the spatial objects that generate the process. Data about the spatial objects are
simply fed to these processes. This is where the subject of different spatial objects such as D-
Branes have come into play. But these only give us a fragmented image of the actual whole
picture with large gaps in the information we get.

Now these gaps are not due to a lack of information. Indead, one of the problems with String Theory, untill perhaps this modification, has been that in the area of the vacuum discribed
one gets too much data. Its as if any vacuum state can be generated from String Theory. The
problem is finding the right solution.

Object-oriented database management systems (OODBMSs) provide object modeling with integrated methods which enhance organization of data and communication between spatial
objects. Furthermore, OODBMS query languages are under development by a standards group
(i.e. ODMG) to specify high-level modeling features.

Contemporary methods for representing spatial processes in GIS typically atomize spatial processes as extensively as possible. Deterministic modeling approaches focus on separating
complex, dynamic processes into manageable and representable components. As a result, attempts to model complex systems that include multiple domains (e.g. physical, biological,
social, and economic) are inadequate, leading to incomplete understanding of the phenomena
and potentially erroneous predictions.

What is needed is a more complete version of fuzzy logic. Indead, in spite of the uncertanity principle. We do know that the results of sub-atomic process are larger scale linear
actions that follow normal Newtonian concepts. So it seems that nature does follow some path
of fuzzy logic to take a path that gives solid results on the large scale. This is where my changing
the concept of Heizenburg into one in which the whole particle becomes the smeared out waveform comes in. From this vantage point a couple of main problems are overcome. 1.)

That of the Uncertanity. 2.) That of the need to re-normalize our answers. But it must be remembered that this does not actually remove those uncertanities. It modifies them. If one
still uses the point-particle approach to study data those uncertanities will still remain. But if one uses this approach. Those uncertanties can be removed by the application of a version of fuzzy
logic.

FUZZY LOGIC SETS

Fuzzy sets were introduced by Zadeh as an approach to handling vagueness or uncertainty
and, in particular, linguistic variables. Classical set theory allows for an object to be either a
member of the set or excluded from the set. This, in many applications, is unsatisfactory since,
for example, if one has the set that describes all males who are tall as those whose height is
greater than 5'8" then a 6'0" male is a member of the set. A male whose height is 5'7 1/4, however, is not a member of the set. This implies that a man who is 1/4 shorter than another
tall man is not tall. By the same token this approach does not differentiate between members.
Michael Jordan (6'8") and Bob John (5'11") are both equally members of the set `tall'.

Although
this appears at face value to be a trivial example there are many domains where this approach is
of little use. Fuzzy sets differ from classical sets in that they allow for an object to be a partial
member of a set. So, for example, John may be a member of the set `tall' to degree 0.8. He is
tall to degree 0.8. Fuzzy sets are defined by a membership function.

This was how this concept was applied to computer programming. My adaption of this has
been to modify first M-Theory back into something more akin to the original point particle and
to apply QM to that changed object. But this membership function can be also applied to other
areas. It might be possible to view, as has always been the goal, the seperate forces and their
particles as simply members of a larger group. Taking what we know from String Theory and
this modification. That larger group is nothing more than gravity altered and working in a different fashion.

A brief definition of a Fuzzy Inferencing System has already been given. Essentially the
advantage of a fuzzy set approach is that it can usefully describe imprecise, incomplete or vague
information. However, being able to describe such information is of little practical use unless
we can infer with it. The accepted method of the application of fuzzy sets is analogous to, but
different from, the way a conventional knowledge based system (KBS) is organised. Assuming
that there is a particular problem that cannot (at all or with difficulty) be tackled by conventional
methods such as by developing a mathematical model, after some process (e.g. knowledge
acquisition from an expert in the domain) the `base' fuzzy sets that describe the problem are
determined. Basically a Fuzzy set can be defined as:
the base fuzzy sets that are to be used, as defined by their membership functions;
the rules that combine the fuzzy sets;
the fuzzy composition of the rules;
the defuzzification of the solution fuzzy set.

The approach adopted for acquiring the shape of any particular membership function is
often dependent on the application. For most fuzzy logic control problems the assumption is that

the membership functions are linear - usually triangular in shape.

The approach adopted by myself is to use inductive reasoning to generate the membership
functions and the rules. They assume they have no information other than a set of data. The
approach is to partition a set of data into classes based on minimising the uncertanity function.
Since I had already found M-Theory to come the closest to the real life sinuation. I followed
it as a basic model. In the area of gravity I already had a working version of gravity that was
based more closer to the older spinnor concept with point particles. But the infinites there
prevented me from having any positive answers. Yet, when I applied the same idea of gravity
into the higher dimensionality and applied the fuzzy logic approach. I was able to derive a
theory that explained gravity, brought it into the QM field Theory fold, and removed the
other problem of uncertanity. But to do so I was forced to modify the original String and
Membrane into something that more equaled the original point particle. The side benefit
of eliminating perturbution surfaced once I had achieved this.

It is interesting in hindsight that the closest man has come to simulating his type of
thinking in the area of computers is through the usage of fuzzy logic. Since it has already been
found that aspects of M-Theory can be applied to the concept of consciousness. Perhaps it
is fitting that since Consciousness is a by-product of natural processes. That a more corrected
version of M-Theory would be found by applying that same Fuzzy Logic to Physics. Weither
this implies a conscious directed creation I leave in the hands of those involved in philosophy
and religion.

GRAVITATIONAL FORCES ON ELEMENTARY

PARTICLES:

Lets compare the force calculated as due to the diverging EM field - with Newton's Law for a
force between two hydrogen atoms. The gravity force between two hydrogen atoms can be
calculated as follows:
Fg=Gm1m2/R2
Is gravity simply a pseudo-force caused by the relativistic effects of moving charges -

calculated
as the divergent EM field? Perhaps gravitation may due to the fact that we do not have the right
coordinate system? Curiously, the divergent atomic EM field does have all the characteristics of
gravity, such as a non-shieldable force that follows the inverse square of distance law. Atoms
that generate an EM field will give rise to nearby electrostatic fields that are set up to counter
balance anything that is polarized by such EM fields. If we ignore the effects of particle spin, it
means that there are no net forces on a single charged elementary particle suspended in a gravitational field - that is, if it is located inside a closed box of normal matter. We can predict
that a single positive or negative elementary particle will "float" in a gravitational field, as if with
no weight. However, a dielectric (such as a neutral atom) will fall in the same situation

It may be argued that elementary particles have no weight at all - and that they only have only inertia and mass. Interpretation of results from a free fall experiment of electrons at Stanford University may suggest that elementary single particles do not have weight. The results
from Stanford University showed that the gravitational acceleration of electrons in a metal tube
was close to zero (measured to within 9%). The scientists explained this unusual result as the
effect of the earth gravitational pull on free electrons in metal. It was argued that each electron
and nucleus in the metal were acted on by an average electrical field (set up by a slight displacement of charges), polarizing the metal and exactly counteracting the free floating electrons inside the tube.

According to the divergent EM field theory, the experiments at Stanford, could be explained by understanding that there are no forces on non-dielectric charged particles (such as
an electron) located in cavity immersed in an EM field. The electrostatic field, setup inside the
cavity to counteract to the EM field, will exactly cancels the EM field because of separation of
charges. Understanding this, a single electron will behave as having no weight, since EM - Es =
0, and the electron will appear to have no acceleration in a gravitational field.

But, given the TEM nature of particles it is possible that what is being observed there is what I have chosen to term a transtation effect. The above cavity was immersed in an EM field.

Even though the frequency is not equal in wavelength to that of an electron. The two waves
would either be additive or subtractive depending upon the phase differences. If it was subtractive, and given that the gravity field generated by elemental particles is so small to begin
with there might have simply occurred a canceling of the inertia field completely or to such an
extent that the electron did behave as if it had no weight.

It is also known that Particles have a diameter roughly equal to the incident wavelength. Which I believe is accountable for a stretching of the basic string so that its net tension is i
increased and thus its frequency and wavelength are increased. This stretching would be accountable due to effects from 6D Higgs space-time. There is a stable solution to Maxwell's
equations which is equivalent to a continuous standing electromagnetic wave arranged concentrically about a point. Standing waves of intermediate sizes explain the Rydberg constant and the fine and superfine structures of spectral lines. Some particles and all atoms are expected
to be composites of different sized waves within each other.

Actually there are a whole set of solutions to Maxwell's equations which take this basic form. They all have the same nodal structure and property that the energy is distributed as the
inverse square of the distance from the center, but the differences are due to the possible different polarization schemes for the light in the wave. It is not possible for all of the light in the
wave to be unpolarized. This is the same situation as the ball of fur which has to have at least
two places where there is a crown. To put it another way, if the wave is considered to be a
displacement of space (as an alternative explanation to Maxwell's equations) then any rotation
of a spherical shell must leave two points unmoved. The point here is that given a certain restraining medium (ie String Tubes) one can set this same effect up in a given small localized
space.

In reference to mass as an electromagnetic effect: the equation E=mc2 can be taken to state the "EM energy trapped in mass" is equal to mc2; since energy can be transformed from one form to another, we are free to pick EM energy. The problem immediately rises on the difference between "energy" and "energy density flow". All EM energy must be in motion at the speed of light, by Einstein's postulate, with respect to any observer. So how can it be seen by the external observer as "sitting still" so as to comprise mass? The answer can be found in E.T. Whittaker, "On the Partial Differential Equations of Mathematical Physics", Mathematische

Annalen, Vol. 57, 1903, p.333-355. Whittaker mathematically decomposes the scalar potential into a harmonic series of bidirectional EM wave pairs. Each wave pair consists of the wave and its phase conjugate. By the distortion correction theorem of nonlinear optics (which did not exist until the mid-1970s), in each wave pair the wave and its anti-wave (phase conjugate replica) must spatially superpose, though anti-phased in the time dimension. Therefore each wavepair is a special kind of standing wave; where at each point an E of the wave and -E of the anti-wave simultaneously superpose. In the superposition, [E + (-E)] individual vectors do not "cancel" and "cease to exist", just as two elephants straining against each other do not "cancel" and "disappear" just because the translation of the two-elephant system is zero. Each elephant is still in there and, as an individual, he is straining mightily. In the wave/anti-wave case, the waves pass through the same space exactly superposed spatially, as seen by the observer. Now to be "seen by the observer", actually a little observation time is required. In other words, what is detected by observation is not E or -E, but Et or -Et. The observation time-differentiates, to get rid of the t. So the "observer" will "see" a zero net E-field, composed of E + (-E) = 0. The scalar field energy densities add at any point, however, while their observed "resultant vector summation" E-field is a zero vector. All the zero vector means is that the system of "seemingly trapped" superposed EM energy at that point is not translating. The energy is not really trapped, in the same way that the water flowing through a steady whirlpool in a river is not static. The whirlpool form (the "collection" form of the water flow) seems static. The flow continues. So it is with so-called "trapped" EM energy.

Superluminal Velocities

Recent experiments with evanescent electromagnetic modes, both in the classical and in the quantum domain, have revealed superluminal group velocities, i.e. velocities faster than the vacuum velocity of light. This surprising behavior has been observed in four laboratories - in Berkeley ["http://www.uni-koeln.de/~abb11/workshop/announceD.html" l , Florence ["http://www.uni-koeln.de/~abb11/workshop/announceD.html" l , Cologne ["http://www.uni-koeln.de/~abb11/workshop/announceD.html" l , and Vienna ["http://www.uni-koeln.de/~abb11/workshop/announceD.html" l - by means of different experimental techniques. This has spawned discussion of basic questions on time order and causality, which have been touched on, in particular in the context of the particle-wave duality. This has possibly far-reaching consequences for the philosophy of science.
In 1994, Miguel Alcubiere Moya, then at the University of Wales at Cardiff, discovered a solution to Einstein's equations that has many of the desired features of warp drive. It describes a space-time bubble that transports a starship at arbitrarily high speeds relative to observers outside the bubble, Calculations show that negative energy is required. Warp drives might appear to violate Einstein's special theory of relativity. But special relativity says that you cannot outrun a light signal in a fair race in which you and the signal follow the same route. When space-time is warped, it might be possible to beat a light signal by taking a different route, a shortcut. The contraction of space-time in front of the bubble and the expansion behind it create such a shortcut.
One problem with Alcubierre's original model, pointed out by Sergei V. Krasnikov of the

Central Astronomical Observatory at Pulkovo near St. Petersburg, is that the interior of the warp bubble is causally disconnected from its forward edge. A starship captain on the inside cannot steer the bubble or turn it on or off; some external agency must set it up ahead of time. To get around this problem, Krasnikov proposed a "superluminal subway," a tube of modified space-time (not the same as a wormhole) connecting Earth and a distant star. Within the tube, superluminal travel in one direction is possible. During the outbound journey at sublight speeds, a spaceship crew would create such a tube. On the return journey, they could travel through it at warp speed. Like warp bubbles, the subway involves negative energy. It has since been shown by Ken D. Olum of Tufts University and by Visser, together with Bruce Bassett of Oxford and Stefano Liberati of the Intenational School for Avanced Studies in Triests, that any scheme for faster-than-light travel involves the use of negative energy.

Warp drives are even more tightly constrained than wormholes, as shown by Pfenning and Allen Everett of Tufts, working with us. In Alcubierre's model, a warp bubble traveling at 10 times lightspeed (warp factor 2, in the parlance of Star Trek, The Next Generation) must have a wall thickness of no more than 10-32 meter. A bubble large enough to enclose a starship 200 meters across would require a total amount of negative energy equal to 10 billion times the mass of the observable universe. Similar constraints apply to Krasnikov's superluminal subway. A modification of Alcubierre's model was reecently constructed by Chris Van Den Broeck of the Catholic University of Louvain in Belgium. It requires much less negative energy but places the starship in a curved space-time bottle whose neck is about 10-32 meters across, a difficult feat. These results would seem to make it rather unlikely that one could constuct wormholes and warp drives using negative energy generated by quantum effects.

Now another problem I have found with this is that negative energy in this context is time reversed matter/energy. As such, the introduction of it into our regular space-time would have far reaching drastic effects. Given the formula E=MC**. Since not only the energy involved in the two systems meeting would be opposite, so would the time elements. As such the two would literally cancel each other out creating an empty void. Since the vacuum states would be different. Literally, our space-time would go down the drain, so to speak.

But as I have already mentioned there is a method where by the same effect could be arrived at without the usage of negative(time reversed) energy. That method I will not here go into.

There is also another method possible. Using the same transtator concept one could shift the waves of the particles ahead. By shifting them ahead in phase one would be changing their time. If this was done to a craft moving at say .5C and the shift was equal to a 1 second difference. Any observation from an outside standpoint would deduce the craft was traveling at C. But, the actual craft would never exceed .5C. Other shift factors could be employed to have the craft doing travel times far faster than this.

Notes

1. Though I personally feel that space-time dictates that the Omega of both sub-spaces be additive. There does remain the possibility that they are not. 6D space-time and 4D space-time

would remain their same values. But the combined effect would be that of .86 for a value of
omega. This would not change the outcome. Due to the nature of 6D space-time the overall end state would remain the same.

2. In classical physics matter is made from particles and electromagnetic radiation is made from waves. In quantum mechanics matter can behave like waves and radiation can behave like particles. This is called the wave-particle duality. Quantum mechanics is necessary to describe the behavior of matter on the scale of atoms and below, and it is also important at large scales for special systems like metals, superconductors, white dwarf and neutron stars, and maybe brains.
As mentioned before the two-slit experiment is the best example of wave-particle duality. One can do a two-slit experiment with an electron beam. The electrons are always detected in tiny lumps like particles, but the probability distribution of their detection is a continuous wave pattern showing interference fringes as long as there is no way to measure which slit the electron goes through.
Feynman in his Cal Tech lectures uses the Copenhagen interpretation. He has a global point of view in that his basic tool is a probability amplitude for a process through space and time. The amplitude is a complex number that can be pictured as an arrow in a plane. The squared length of this vector is proportional to the probability that the process will be measured. The orientation of this vector in the plane is the quantum mechanical "phase". The absolute phase has no physical meaning because the choice of coordinate system is arbitrary. Only the difference in phases, (i.e., the angles between pairs of vectors) is invariant (i.e., does not change) under a rotation of the coordinate system. This approach leaves only the relative phase as important.
The first equation of wave-particle duality was discovered by Max Planck in 1900 when he successfully explained the distribution of energy E with frequency f in black body radiation that is in thermodynamic equilibrium with the atoms in the walls of a container. Classical physics was in crisis because it predicted that the intensity of radiation would explode to infinity with increasing frequency. Experiment showed a nice decrease of the intensity with increasing frequency. Planck made a wild guess that the transfer of energy between atoms and radiation at a fixed frequency f was not continuous but happened in integer multiples of that frequency. The constant of proportionality is h and is called Planck's constant. It is very tiny equal to about 6.6*10^-34 Joule-seconds. Planck's formula was
E transfer = nhf, n = 0,1,2, 3, ...
Einstein extended Planck's idea five years later to explain how light ejects electrons from metals. The energy of these electrons only depended on the frequency and not the intensity of the radiation falling on the metal. If the frequency was too low no electrons would be ejected no matter how intense the radiation. The number of electrons ejected did depend on the intensity. Einstein had the second important wild idea that light waves really consisted of "photons" each of energy E = hf. E is a particle property while f is a wave property. We know from the mathematics of Fourier analysis that a wave of single frequency f must extend infinitely in time. The analogous oscillations of the wave in space in a given direction are described by a wave number k. For radiation f = ck. A wave of definite k must be a periodic pattern extending infinitely along the direction or

propagation in space. The distance between successive crests is the wavelength 2pi/k = lambda.
Louis DeBroglie, shortly after WWI, had a third wild idea in which he applied the wave particle duality and special relativity to matter. He predicted that particles like electrons could also behave like waves. A particle of momentum p in a given direction would have a wave length lambda such that p = h/lambda.
Schrodinger built upon De Broglie's crazy idea to develop a wave equation which explained atomic spectra much better than Bohr's atomic mechanics which implicitly had DeBroglie's idea in it before DeBroglie rediscovered it. The important point is that Bohr and others did not see the physical implications of a certain formal step in the atomic mechanics of electrons bound in atoms to their free behavior in beams. The new mechanics was so alien to classical physics that the great geniuses were mind-boggled and only slowly realized what they were doing. In fact, as Feynman points out we still don't really adequately understand quantum mechanics and its limits and how it makes the apparently classical world even though we can make astoundingly accurate computations of some experimental numbers using its mathematics.
But as I mentioned before. This probability wave is not the same as another wave aspect my Theory, and most of regular field theory deals with. That being the before mentioned TEM wave.
Before I go further with this Transtator concept I would like to discuss another aspect of a wave which is its phase. But first I will discuss it from the above aspect.
- The quantum wave function of a particle has a phase associated with it at every point, like the second hand of a clock. - This phase rotates at a speed proportional to the energy. (The constant relating revs per second to energy is Planck's constant h.) - The variation of the phase over *space* is proportional to the momentum of the particle. (The constant relating revs per meter to momentum is again h.)
Now, suppose I have an object whose wave function is spread out over some little region. It's just been dropped from rest so its wave function's phases are in sync everywhere (well, close enough). Since we are doing relativity we have to include the mass in the energy. This provides the lion's share of the energy. So the phase everywhere is spinning around, and the frequency in revs per second is hmc^2. But because of gravity, time goes at a slightly faster rate at the top part of the wave function than at the bottom. So with time, the phases will gradually become unsynchronized. Over a vertical distance d, the phases get out of sync at a rate hmc^2 times the difference in time rates, which is the difference in gravitational potential over c^2, which is dg/c^2, where g is a familiar number, 9.8 m/s^2, near the Earth's surface. So the rate at which they get out of sync is hdmg. But since the phases vary more and more over *space*, that means that the momentum is increasing. The rate of change of momentum is mg. But the rate of change of momentum is the *force*, in Newtonian terms. So we've derived from general relativity and quantum mechanics that if time varies at a rate g/c^2 per meter, the gravitational force on a particle will be mg.
As mentioned earlier, this can also be shown from the proposed modified field gauging I have employed with my particle description.
Now as concerns the TEM wave it can be found that phase here deals again with an aspect of time. In this case the example of two em waves will be used. If two waves are displayed with 1 180 degrees ahead of the other the time as far as completion of a single

cycle will be found to be different. The wave that is 180 degrees ahead in phase will end its cycle 1/2 second ahead of the other. Given the TEM nature of particles what I am proposing is that since EM waves and TEM waves should interfer with each other there would be a way using phase shifted EM waves of the exact TEM frequency to shift particles themselves ahead in time or phase. If this was applied to large scale objects like a space craft and the craft was traveling at an actual velocity of .5C. Then if the shift was 1/2 second ahead. That craft as far as travel time would appear to have traveled at a velocity of C. This could then be carried forward to any arbitrary Theoretical velocity as far as measured travel time without any actual increase is a craft's actual velocity. But do remember at current time we do not have the ability to generate em waves of the exact frequency and phase needed. This is only a speculation of what we might someday be able to do.

Further Proof of the ZPF and Gravity coming from the background.

In October 1977, the Russian astronomers Kosyrev and Nasonov performed measurements of several stellar objects, using for the first time a crystal detector grown outside the gravitation field of the earth. They wanted to measure the detailed intensity profiles of some objects, in order to verify astrophysical models. It was expected to find maximal radiation intensity in the center of the galaxies, while the intensity towards the periphery was expected to decrease exponentially in agreement with the lower star density in these regions.
But contrary to the expected scenario, the new detector provided an intensity profile, that was exactly contrary to the light profile expected, e.g. with a minimum in the center of the galaxies and a maximum towards the boarders. Even with the reflector covered by a metal plate, the signal they received remained unchanged. After shielding and compensating the detector in different ways, the effect could not be eliminated and was even stronger in certain cases.
After years of further research in an attempt to seek a logic explanation, they concluded that the measured effect was definitely gravitation. Ample laboratory experiments they performed have confirmed that the detector was extremely sensible to gravitation. But contrary to any known gravitation theory (e.g. Newton, Einstein), the effect was not stronger close to matter (galaxies), rather it was stronger further away in the outer space. They suggested that "if gravitation is anti-symmetric to electromagnetic waves (light), the only explanation that remains is that gravitation is a medium, that is generated in space and absorbed by matter. Matter is therefore not an emitter of gravitation, but a collector. Probably, at the marginal regions of the observed galaxies, gravitation is being converted into matter, and closer to the stars, gravitation is probably absorbed strongly, so that here, a deficit of gravity appears.
Given the before mentioned cause of gravity I have found aspects of this research which backs up my theory. First off, as they did I have proposed that the graviton/Higgs' fields are the medium of 10D space-time. Secondly, from our limited 4D space-time perspective since 6D Higgs space-time is hidden away inside of all points of 4D graviton space-time it would give observed results as if matter was the collector of gravity. So I find this research backs up rather nicely my own proposed theory.
Firstly, we observe that the above findings are completely coincident with the predictions

of the Modified M-Theory.
1. There exists an isotropic field in the universe (the most isotropic of all fields is a field with the properties of the ZPF.
2. The isotropic field is independent to the presence of matter.
3. The isotropic field is able to generate gravitation because of its structure.
4. The isotropic field actually is the source of all matter.
5. The effects of the isotropic field cannot be shielded by metal plates, as in the case of light or magnetism.

Longitudal Force Explained

Peter Graneau, Northeastern University, Boston, First, although the Lorentz force equations and Maxwell's equations provide excellent insight into electrodynamics, there are many cases where the abandoned Ampere equations are superior. Second, there are still many experimental anomalies that are not explained by any of the current scientific models and these anomalies deserve the attention of the scientific community.
Ampere's force equations are based on a model of a current element which is the electrical conductor, and on the concepts of Newtonian physics. The Lorentz and Maxwell's equations, although based strongly on Ampere's work, have as the current element the electrical current (now considered to be the discrete electrons) and include field forces which make these equations relativistic and non-Newtonian.
The difference between equations formulated by Weber and those of Ampere were reconciled by a constant which had to have the dimensions of velocity. This constant had to have the value c = 3 x 10 E+10 cm/sec. "This constant became known as the velocity of light and it always emerges when the laws of electrostatics are combined with those of electrodynamics. ... This is how the velocity of light made its first appearance in the literature and Newtonian electrodynamics."
Ampere also postulated a longitudal force that has no counterpart in currently accepted EM theory. Mechanical forces arising in electron-lattice collisions are negligibly small and are certainly unable to account for the longitudinal forces predicted by Ampere's law. ... The parallel existence of both ponderomotive and electromotive forces has become the hallmark of Newtonian electromagnetism."
Ampere found that a force is exerted on a current-carrying wire in a magnetic field
F = B I L sin f
where B is the magnetic field in Teslas (T), I is the curent, L is the length of wire in meters, and f is the angle. Only the perpendicular component of B exerts a force on the wire. If the direction of the current is perpendicular to the field (f=90), then the force is given by
F = B I L
I am aware that current flow around a closed circuit, including an electron discharge across an air gap, can involve forces tending to expand the circuit. That arises from the energy of the self-inductance, which, acting in an energy adjustment sense opposite to that of electric potential, tends to increase, meaning that if the circuit or an arc discharge in that circuit can expand, it will, because that increases the self-inductance. On the face of it such experiments can, it seems, disprove the Lorentz force law and show that forces in line with current flow are present, but far more is needed before the Ampere law can

be said to be proved. This applies not only to tests using a.c. in which an electrode has freedom of movement, but also to moderately rigid closed circuits subjected to a sudden d.c. high current impulse, where the tug-of-war between the inductive back EMF and the forward EMF can tear the wire conductor into small pieces. This is known as the exploding wire phenomenon but it is not the same scenario as that on which the derivation of the Ampere law of electrodynamics is based, namely steady-state current flow around a specific circuit path. Once change of self-inductance or mutual inductance gets into the act, then there is cause for setting up a force acting along the path of current flow and, even though there is no net magnetic flux change in linking a closed circuit, there can be such forces set up in different segments of that path, that is even though no net EMF is generated around the circuit as a whole. Simular effects have been very often noted in Tesla Coil experiments like those used to shrink certain metals.
However,I believe there is an answer to this that stems out of my modification to M-Theory. Given the high voltages involved in those Tesla coil experiments I believe the longitudal forces are generated by a forced compaction of the basic tubes. For the wires that every case has found stressed and fragmented by themselves seems to point at this. 10 Gauge wire was expanded. This expansion was most likely due to heat and to the normal emf forces and those mentioned above. But the fracturing I believe happens because as the basic atomic strings expand due to amplitude increases in their basic waveform they also expand in their length dimension causing structural failure in that direction of the basic structure they compose. This would give the effect of simulating a longitudal force. Since the individual electrons flowing in those wires depending upon their position and orientation would all experience different effects. It is not surprizing the wires fragmented into odd links.

Spin and the Lorentz Formulas

I propose that spin for all Bosons is equally guaged from their velocity. Since their velocity is in free space equal to C. Their spin velocity would be even multiples of C. I also propose that for Fermions this is not the case. Since they have fractional states their spin velocity must also be fractional. But, unlike bosons that can either be 2,1,-1, or -2, they can be any fractional portion of C. I also believe this is the scource of the limiting velocity of matter. If their spin states, in order to keep even are guaged in such a fashion that as their velocity increase the spin velocity is guaged following the Lorentz formula that mass follows no particle possessing mass can ever be accelerated to C. To do so would require an infinite spin velocity.
This also implies that all particles that are massless would, if they were at rest, display polorized stationary fields. You would literally see them in all their frozen naked glory. This also explains the length shortening effect acceleration has. As a particle is accelerated its amplitude increases while its string length shrinks. This effect is seen even in large scale objects undergoing increasing spin. They flatten out.
This brings up a very unique explination to certain experiments conducted in Russia and being researched by NASA here in the US. Those experiments dealing with Fast spinning Superconductive magnetic disks have noted a weight loss in certain objects suspended above them. I think it is possible that the natural spins's of the particles have become locked with that spinning magnetic field. If their spin was retarded from their natural

state slightly counteracting inertia's effects within their local frame they would display a mass loss. It would be as if they existed within a different inertia frame. I have found eveidence of this from String Structure as proposed in this Modification. The following partial notes may be helpful.

Notes on Inertia

1. Inertia is direct product of increase in spin velocity for all Fermions states.
2. Increase in velocity cause contraction in direction of motion due to flattening effect of increased spin velocity on string length and resulting amplitude increase.
3. Amplitude increase, with length contraction causes minimal time interval to increase in size thus shortening time length for the object being accelerated.
4. All Tacyion states would have a reversed time frame with the motion of those particles backward from our relativistic time frame.
5. The reason inertia and gravity are interchangeable is because the increase in the energy of the 4D Space-time components cause an equal increase in the compaction of 6D Higgs space-time.
6. If the spin velocity of a particle could be slowed, without slowing the linear velocity inertia could be counteracted. Only method possible that would not require infinite energy at velocity of C is one using a Gauging field that causes all fermions to stay gauged in line with its field. At present we have no known method to achieve production of such a field. However, it is possibly that a strong rotating magnetic field could cause them to lock up with its orientation if the initial rotation velocity was equal to the original spin velocity.

What Remains.

Which is more important? Space-time or the fields? I believe it is the fields that give substance to space-time. Not space-time that gives substance to fields. I can partly prove my own theory's conclussions and this point with the following example. We know from General Relativity that space-time is curved. But is it the particles that follow the curvature or the fields?

If you take a magnet or a singular dipole and accelerate it. Its fields remain static in relation to that dipole. They do not bend due to acceleration or gravity no matter the direction of travel. Given this and the Fact that we can measure effects of the magnetic field of Blackholes or at least suspected blackholes. It would seem that the curvature of space-time does not effect fields. It effects the particles those fields generate. Since the particles are the result of the geometry of space-time. Then I believe the true substance of nature is the fields themselves. The more we understand them and utilize them. The closer we get to a true TOE.

Modifying Kerr Solution

When we apply this transformation to the Schwarzschild solution, we get the so called Taub-NUT solution when dealing with Kerr Solutions to Blackhole Geometrodynamics. This solution was found in the 50's by Taub and later in the 60's by Newman, Unti and

Tamborino, as a solution of the vacuum Einstein equation. The problem is the solutions is not asymptotically flat. Furthermore, consistency requires a periodic interpretation of the time-coordinate, otherwise there would be extra singularities. If we set Q Taub equal to zero, we recover the Schwarzschild solution. The normal solution would have been Q taub sin Theta. To prevent the Taub-NUT charge from appearing we allow Y3 to drop off faster than 1/r at infinity.
So the modification of the Kerr Solution I propose only allows the Taub-Nut version when referencing either the origin of space-time, or when dealing with the tube in a tube structure of particles. This tells us something about two important conditions. That of the origin point and of the membrane dividing 4D Graviton space-time from 6D Higgs space-time. In both of these regions the drop off is slower than 1/r at infinity. The reason for this comes in the area of the elastic/repulsive forces. At the Start of creation the energy from 6D Higgs space-time was zero. But the energy from the phase shifted 4D Graviton space-time had a large value. While one expanded the other compacted.
But if you study the difference in energies in both sub-spaces you find that one had a rate change faster than the other. 4D space-time experienced a slower drop off than 6D Higgs space-time. This accounts for the vacuum not being a net zero and yet, it cancels to 120 places. What makes normal space so flat is all the charges created by the vacuum cancel out globally. In the two referenced regions they do not. This extra energy is the Taub-Nut charge.
You might also want to look at Taub-NUT vacuum, which is a perturbation of the Schwarzschild vacuum which is regular in the interior region (the singularity has been smoothed out into a "hump"). An ONB for inertial nonspinning observers in the interior region is:
o^1 = sqrt(1+n^2/t^2)/sqrt(n^2/t^2+2m/t-1) dt
o^2 = 2*sqrt(n^2/t^2+2m/t-1)/sqrt(1/t^2+1/n^2) dw + 2*cos(u) sqrt(n^2/t^2+2m/t-1)/sqrt(1/t^2+1/n^2) dv
o^3 = sqrt(n^2 + t^2) du
o^4 = sqrt(n^2 + t^2) sin(u) dv
m - sqrt(m^2+n^2) < t < m + sqrt(m^2+n^2
0 < w < 4 Pi, 0 < u < pi, -Pi < v < Pi
I believe the tube structure flattens the hump singularity out into more of a classic membrane from regular M-Theory depending upon your choice of view. Indead, the surface dividing line between 4D Graviton space-time and 6D Higgs space-time does form a membrane of the classic String Theory type. At that scale reversion to the original M-Theory and its study of Brane structures yields more exact answers for boundary conditions between the two sub-spaces.

Taub-Nut surface Geometrodynamics and the entropy of the ZPF

If one considered reference backgrounds, and other Euclidean solutions, which have a U1 isometry group, with Killing vector, K. The isometry group, will have fixed points where K vanishes. To classify the possible fixed point sets in four dimensions, into two-dimensional surfaces I call Membranes in the classical M-Theory usage, and isolated points that I call nuts. However, one can extend this classification scheme, to Euclidean metrics of any dimension. The fixed-point sets will then lie on totally geodesic sub manifolds, of even co-dimension.

?Let tau be the parameter of the U1 isometry group. Then the metric can be written in the Kaluza Klein form, with tau as the coordinate on the internal U1. Here V, omega i, and gamma i j, are fields on the d minus one-dimensional space, B, of orbits of the isometry group. B would be singular at the fixed points, so one has to leave them out of B, and introduce d minus two dimensional boundaries to B. The coordinate tau can be changed by a Kaluza Klein gauge transformation, that is, by the addition of a function, lambda on B. This changes the one form, omega, by d lambda, but leaves the field strength, F = d omega, unchanged. If the orbit space, B has non trivial homology in dimension two, the two form, F, can have non zero integrals over two cycles in B. In this case the potential one form, omega, will have Dirac like string singularities, on surfaces of dimension d minus three in B. The foliation of the space-time by surfaces of constant tau, will break down both at the fixed points of the isometry, and on the Kaluza Klein string singularities of omega, which I will call membranes. Membranes are surfaces of dimension d minus two in the space-time.

In order to do a Hamiltonian treatment using surfaces of constant tau; one has to cut out small neighborhoods of the fixed-point sets, and of any membrane. The action given by beta times the value of the Hamiltonian, will then be the action of the space-time, with the neighborhoods removed. Putting back the neighborhoods, the Einstein Hilbert term will give a contribution of minus a quarter area, for the membrane and the d minus two-dimensional fixed-point sets. But the contribution to the action from lower dimensional fixed points, will be zero. As before, the Hamiltonian surface terms at the fixed points, will be zero, because the lapse and shift vanish there. But the shift won't vanish on the membrane, so there will be a Hamiltonian surface term on a membrane, given by the shift, times a component of the second fundamental form, of the constant tau surfaces. Thus the action will be made up of several contributions. First, there will be beta times the Hamiltonian surface terms at infinity, and on the membrane. Then one has to subtract one over 4 G, times the sum of the areas of the bolts, plus the membrane. Finally, one has to subtract the same quantities for the reference background. Some or all of these quantities may diverge, but the differences from the reference background will have finite limits, as the boundary is taken to infinity. . The partition function, Z, can be related by thermodynamics, to the entropy, and the conserved quantities like energy, angular momentum, and electric charge, whose values are not fixed by the boundary conditions. One has log Z, = the entropy, minus the sum of the conserved quantities, each weighted by its thermodynamic potential. But the Hamiltonian surface term at infinity, multiplied by beta, is by definition, the sum of the conserved quantities, weighted by their thermodynamic potentials. Thus taking the action to be minus log Z, one gets that the entropy is a quarter the area of the bolts, and membrane, minus beta times the Hamiltonian surface term on the Membrane. One can make a Kaluza Klein gauge transformation, by changing tau by a function, lambda, on the orbit space. This will change the position and area of the membrane, but the combination, a quarter string area, minus beta the Hamiltonian surface term on the string, will be gauge invariant. Again, this shows that entropy is a global property. It can not be localized in microstates on the membrane.

Asymptotically local flat solutions, have a Nut charge, or magnetic type mass, N, as well as the ordinary electric type mass, M. The Nut charge is beta over 8 pi, times the first

Chern number of the U1 bundle, over the sphere at infinity, in the orbit space, B. The natural reference backgrounds for solutions with Nut charge, are the self dual multi Taub Nut solutions, which have M=N. When written in Kaluza Klein form, the multi Taub Nut solutions with no bolts, or fixed point sets of dimension two. They do however, have a number of Nuts, or fixed-point sets of dimension zero. From each Nut, there is a membrane, leading to either another Nut, or infinity. The positions and areas of the membrane, is gauge dependent. However, a quarter the area of the membrane, minus beta times the Hamiltonian surface term on the strings, is gauge invariant, and is independent of the position of the Nuts in the three dimensional flat orbit space. Thus the entropy of the multi Taub Nuts, is zero, as is not the case for our space-time vacuum field. Indeed, the problem is settled with the before mentioned gauging from this theory whereby the entropy of the dual Taub Nut system becomes slightly more than zero, but still canceling to the 120th place. This is how the Modified M-Theory manages to generate the correct vacuum for our present space-time. Part of the answer is the particle structure I have proposed is not an asymptotically local flat solution. As you remember one of the proposed field gauging with the spin axis keeps the local solution curved. Also the internal setup has a positive entropy, while the outer has a negative one. These two together provide the right canceling factors.

First, thermal radiation in asymptotically flat space, all the way to infinity, yields the energy density that curves the space, and makes it an expanding Friedmann universe. Secondly, since the 6D source of this thermal radiation evolves with time and distrubution of matter as relates to the over all mass density the Omega of this expanding Friedmann universe will depending upon how you observe or study it give different values. It is this, as I have mentioned before and in the original working Thesis : A MODIFIED M-THEORY viewable at http://www.superstringtheory.fanspace.com that gives us a Universe with an observed mass density based Omega value of slightly greater than .18, an observational Omega value of 1, and an actual value of slightly more than 1.18. Thus, some of the old Dark Matter issue is settled by this alone.

No Bending of magnetic field lines due to gravity.

A magnetic field is not effected by a gravity field. This can be shown by the movement of a magnet in any direction with its field lines compared to those at rest. There is no bending of those field lines due to acceleration against gravity. Given this, one is led to the conclusion that fields are not themselves subject to the bending effects of gravity. It is the particles that generate such fields that respond to the curvature of space-time. As I have mentioned before, since gravity is simply a geometric effect of the combined curvatures of 4D Graviton space-time with 6D Higgs space-time caused at the overlap of the two fields energy within a localized region this would be in agreement with the above stated fact. The magnetic field produced by say a single dipole would transfer across space-time when it was in motion without any bending of that field inspite of the curvature of space-time. The only item effected by curvature would be the path of that dipole. Thus, a blackhole should have a measurable magnetic field.

But this shows another aspect this theory leads to. That being that space-time is not fundamental. The fields are the fundamental element of the universe. The illustration

above shows that the magnetic field is not effected by the curvature of space-time since acceleration , or rather, inertia is equivelent to gravity. Then it follows that the curvature of space-time must be a result of a field. What then is a field?
A field is at its simplest energy without form. That energy has two types. The negative one of 4D graviton space-time. And the Positive one of 6D Higgs' space-time. It is only when and at points that this energy blends together that we have form in the different particles. What controls the type of particles is as mentioned earlier. This negative/positive or elastic/repulsive energy is the most basic field. Gravity, EM, the Strong Force, and the Weak Force are all just products of this greater field. Together these all determine the shape of what we call space-time and as such the form. But even within space-time the fields remain the real structure behind that which we can observe.
I leave you with two quotes from religion to ponder and a Thought.
IN THE BEGINNING GOD CREATED THE HEAVENS AND THE EARTH. AND THE EARTH WAS WITHOUT FORM AND DARKNESS WAS UPON THE FACE OF THE DEEP. AND THE SPIRIT OF GOD MOVED UPON THE DARKNESS AND SAID, LET THERE BE LIGHT.

...AND WE KNOW THAT ALL IS FRAMED UPON THINGS UNSEEN.

It is interesting that something written thousands of years ago could say a few things that Science now knows is truth. The Universe started without a set form. First there was light and eventually order.
And the truest substance of the Universe is unseen.

Afterwards
The Multiverse

A Question Posed

Some of the original String Theories before the advent of M-Theory all had different dimensional structures, different vacuum states, and different set of particles that could exist under them. There are 5 to 48 varying amounts of dimensions these early open and closed systems could work with. With the advent of M-Theory all the other versions were found to be backwards derived from M-Theory itself. Now, given this it seems just as likely that the real universe, of which we are a part or a sub-space, may very well have many different domains each with their own vacuum state, their own particle set, and their own forces at work. Given the fact that M-Theory can generate all these different set. Why couldnâ€™t the universe itself? Perhaps we are just one of many domains or universes existing in a far great Multiverse. The only tie that would bind each would be the Membrane itself. That and gravity.

This then is going to be my attempt at an answer to this question. But before I can answer it I must first look a bit at two interconnected features. These being the different String Theory models with their derived relationship to M-Theory. And secondly, to the wavefunction issue from regular Quantum Mechanics. Since QM predates String Theory

I will start with that aspect.
Modern physics is dominated by the concepts of Quantum Mechanics. Until the closing decades of the last century the physical world, as studied by experiment, could be explained according to the principles of classical (or Newtonian) mechanics: the physics of everyday life. By the turn of the century, however, the cracks were beginning to show and the disciplines of Relativity and Quantum Mechanics were developed to account for them. Relativity came first, and described the physics of very massive and very fast objects, then came Quantum Mechanics in the 1920's to describe the physics of very small objects.
At the macroscopic scale we are used to two broad types of phenomena: waves and particles. Briefly, particles are localised phenomena which transport both mass and energy as they move, while waves are de-localised phenomena (that is they are spread-out in space) which carry energy but no mass as they move. Physical objects that one can touch are particle-like phenomena (e.g. cricket balls), while ripples on a lake (for example) are waves (note that there is no net transport of water: hence no net transport of mass).
In Quantum Mechanics this neat distinction is blurred. Entities which we would normally think of as particles (e.g. electrons) can behave like waves in certain situations, while entities which we would normally think of as waves (e.g. electromagnetic radiation: light) can behave like particles. Thus electrons can create wave-like diffraction patterns upon passing through narrow slits, just like water waves do as they pass through the entrance to a harbour. Conversely, the photoelectric effect (i.e. the absorption of light by electrons in solids) can only be explained if the light has a particulate nature (leading to the concept of photons).
Such ideas led DeBroglie to the conclusion that all entities had both wave and particle aspects, and that different aspects were manifested by the entity according to what type of process it was undergoing. This became known as the Principle of Wave-Particle Duality. Furthermore, DeBroglie was able to relate the momentum of a "particle" to the wavelength (i.e. the peak-to-peak distance) of the corresponding "wave". The DeBroglie relation tells us that p=h/lambda, where p is the particle's momentum, lambda is its wavelength and h is Planck's constant. Thus it is possible to calculate the quantum wavelength of a particle through knowledge of its momentum.
This was important because wave phenomena, such as diffraction, are generally only important when waves interact with objects of a size comparable to their wavelength. Fortunately for the theory, the wavelength of everyday objects moving at everyday speeds turns out to be incredibly small. So small in fact that no Quantum Mechanical effects should be noticeable at the macroscopic level, confirming that Newtonian Mechanics is perfectly acceptable for everyday applications (as required by the Correspondence Principle). Thus a Quantum Mechanical description, which includes their wave-like aspects, is essential to their understanding.
Then Schrodinger came along with his important probability wave function. There are actually two Schrodinger equations: time-dependent and time-independent. The approach suggested by Schrodinger was to postulate a function which would vary in both time and space in a wave-like manner (the so-called wavefunction) and which would carry within it information about a particle or system. The time-dependent Schrodinger equation allows us to deterministically predict the behaviour of the wavefunction over time, once

we know its environment. The information concerning environment is in the form of the potential which would be experienced by the particle according to classical mechanics Whenever we make a measurement on a Quantum system, the results are dictated by the wavefunction at the time at which the measurement is made. It turns out that for each possible quantity we might want to measure (an observable) there is a set of special wavefunctions (known as eigenfunctions) which will always return the same value (an eigenvalue) for the observable. e.g.....

EIGENFUNCTION always returns EIGENVALUE
psi_1(x,t) a_1
psi_2(x,t) a_2
psi_3(x,t) a_3
psi_4(x,t) a_4
etc.... etc....

where (x,t) is standard notation to remind us that the eigenfunctions psi_n(x,t) are dependent upon position (x) and time (t).
Even if the wavefunction happens not to be one of these eigenfunctions, it is always possible to think of it as a unique superposition of two or more of the eigenfunctions, e.g....

psi(x,t) = c_1*psi_1(x,t) + c_2*psi_2(x,t) + c_3*psi_3(x,t) + ...

where c_1, c_2,.... are coefficients which define the composition of the state.

If a measurement is made on such a state, then the following two things will happen:
The wavefunction will suddenly change into one or other of the eigenfunctions making it up. This is known as the collapse of the wavefunction and the probability of the wavefunction collapsing into a particular eigenfunction depends on how much that eigenfunction contributed to the original superposition. More precisely, the probability that a given eigenfunction will be chosen is proportional to the square of the coefficient of that eigenfunction in the superposition, normalised so that the overall probability of collapse is unity (i.e. the sum of the squares of all the coefficients is 1).
The measurement will return the eigenvalue associated with the eigenfunction into which the wavefunction has collapsed. Clearly therefore the measurement can only ever yield an eigenvalue (even though the original state was not an eigenfunction), and it will do so with a probability determined by the composition of the original superposition. There are clearly only a limited number of discrete values which the observable can take. We say that the system is quantised (which means essentially the same as discretised).
Once the wavefunction has collapsed into one particular eigenfunction it will stay in that state until it is perturbed by the outside world. The fundamental limitation of Quantum Mechanics lies in the Heisenberg Uncertainty Principle which tells us that certain quantum measurements disturb the system and push the wavefunction back into a superposed state once again.
For example, consider a measurement of the position of a particle. Before the

measurement is made the particle wavefunction is a superposition of several position eigenfunctions, each corresponding to a different possible position for the particle. When the measurement is made the wavefunction collapses into one of these eigenfunctions, with a probability determined by the composition of the original superposition. One particular position will be recorded by the measurement: the one corresponding to the eigenfunction chosen by the particle.

If a further position measurement is made shortly afterwards the wavefunction will still be the same as when the first measurement was made (because nothing has happened to change it), and so the same position will be recorded. However, if a measurement of the momentum of the particle is now made, the particle wavefunction will change to one of the momentum eigenfunctions (which are not the same as the position eigenfunctions). Thus, if a still later measurement of the position is made, the particle will once again be in a superposition of possible position eigenfunctions, so the position recorded by the measurement will once again come down to probability. What all this means is that one cannot know both the position and the momentum of a particle at the same time because when you measure one quantity you randomise the value of the other. See below....

notation: x=position, p=momentum

action	wavefunction after action
start	superposition of x and/or p eigenfunctions
measure x	x eigenfunction = superposition of p eigenfunctions
measure x again	same x eigenfunction
measure p	p eigenfunction = superposition of x eigenfunctions
measure x again	x eigenfunction (not necessarily same one as before)

Now at this point lets just surfice it to say that the basic concept of the wave function is one of a multi-path view. Simply put, there are an infinite(In Theory, not reality) paths a particle can take. The smaller or more narrow one tries to make one’s discription of a **particle the harder it is to narrow down any other aspect of that particle.**

The time-dependent Schrodinger equation allows us to calculate the wavefunctions of particles, given the potential in which they move. Importantly, all the solutions of this equation will vary over time in some kind of wave-like manner, but only certain solutions will vary in a predictable pure sinusoidal manner. These special solutions of the time-dependent Schrodinger equation turn out to be the energy eigenfunctions, and can be written as a time-independent factor multiplied by a sinusoidal time-dependent factor related to the energy (in fact the frequency of the sine wave is given by the relation E=h*frequency). Because of the simple time-dependence of these functions the time-dependent Schrodinger equation reduces to the time-independent Schrodinger equation for the time-independent part of the energy eigenfunctions. That is to say that we can find the energy eigenfunctions simply by solving the time-independent Schrodinger equation and multiplying the solutions by a simple sinusoidal factor related to the energy. It should therefore always be remembered that the solutions to the time-independent Schrodinger equation are simply the amplitudes of the solutions to the full time-dependent

equation.
The bottom line is that we can use the time-dependent Schrodinger equation (or often the simpler time-independent version) to tell us what the wavefunctions of a quantum system are, entirely deterministically. That is, we do not have to resort to the language of probability. Once we try to apply this knowledge to the real world (i.e. to predict the outcome of measurements, etc) then we have to speak in terms of probabilities.
Next, in the early days of String Theory work it was found that an almost endless amount of solutions were possible. Some of the original Klien type examples had as little as four dimensions. Later methods expanded to include models with 8, 10, 16, 20, 24, and on up to one model that worked with some 48 dimensions. In each case, these dimensions not only controled how many particles and supersymmetry particles existed. But also the scale of the forces involved and the very vacuum state itself. Some versions had far more vacuum energy than our present universe displays.
Then along came M-Theory, with my own proposed modification to it that allowed us to view all these other seperate String Versions as derived from one common background. The problem is if that is the case, and one version of String Theory that has only say 5 dimensions can be related to something that has say 48 dimensions then the more complete view of the full universe must be telling us something.
That something I believe is related back to the older Quantum probability wave function issue. Some of those probabilities imply states of existance impossible within our known space-time. Some are even impossible within the framework I proposed in my own modified M-Theory version. The usual method has been to ignore those answers. But I have become convinced those answers do exist somewhere within the great Multiverse. If one abstracts from the reverse and takes that those other String Versions are derived in real space and time from a common ground. Then those answers imply the more complete universe is composed of many sub-spaces. If one takes ours with its 4D+6D framework as the middle or common value. Then one begins to get a picture of the larger universe as having many domains. The one common factor in all becomes the membrane itself.
Steven Hawking proposed the original idea that our universe might give birth to many universes. I think when one takes this viewpoint I am proposing then it would be better to say, Our Universe was one of many born at the same place and time.
How does this effect us?
One of many ways. We have formulas now used to predict how many worlds like ours might be out there in this vast universe we exist in. Try those formulas extended into many universes forming a greater multiverse. We have scientist searching for means of traveling to the Stars. Perhaps one day we will do it by taking a short cut through another universe. Most of what we have today is based upon the usage of energy we harnessed from the EM field. How many other fields exist out there for us to learn to harness?